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COTTON SEED OIL. SOME OF ITS USES IN PHARMACY, AND ITS DETECTION WHEN MIXED WITH OLIVE OIL.

By S. S. Bradford, Ph.G.

Having had occasion during the last six years to manufacture lead plaster in considerable quantities, it occurred to me that cotton seed oil might be used instead of olive oil, at less expense, and with as good results. The making of this plaster with cotton seed oil has been questioned, as according to some authorities the product is not of good consistence, and is apt to be soft, sticky, and dark colored, but in my experience such is not the case. If the U. S. P. process is followed in making this plaster, substituting for the olive oil cotton seed oil, and instead of one-half pint of boiling water one and one-half pint are added, the product obtained will be equally as good as that from olive oil. My results with this oil in making lead plaster led me to try it in making the different liniments of the Pharmacopœia, with the following results:

Linimentum Ammoniæ.—This liniment, made with cotton seed oil, is of much better consistency than when made with olive oil. It is not so thick, will pour easily out of the bottle, and if the ammonia used is of proper strength will make a perfect liniment.

Linimentum Calcis.—Cotton seed oil is not at all adapted to making this liniment. It does not readily saponify, separates quickly, and it is almost impossible to unite when separated.

Linimentum Camphoræ.—Cotton seed oil is far superior to olive oil in making this liniment, it being a much better solvent of camphor. It has not that disagreeable odor so commonly found in the liniment.

Linimentum Chloroformi.—Cotton seed oil being very soluble in chloroform, the liniment made with it leaves nothing to be desired.

Linimentum Plumbi Subacetatis.—When liq. plumbi subacet. is mixed with cotton seed oil and allowed to stand for some time the oil assumes a reddish color similar to that of freshly-made tincture of

myrrh. When the liquor is mixed with olive oil, if the oil be pure no such change takes place. Noticing this change, it occurred to me that this would be a simple and easy way to detect cotton seed oil when mixed with olive oil. This change usually takes place after standing from twelve to twenty-four hours. It is easily detected in mixtures containing five per cent. or even less of the oil, and I am convinced, after making numerous experiments with different oils, that it is peculiar to cotton seed oil.

Charlestown, Mass., September, 1882.

AMMONIUM IODIDE.

By John A. Lambert, Ph.G.

From an Inaugural Essay.

The author discusses the various methods which have been proposed and arrives at the conclusion that acceptable results are obtained by the process adopted by the U. S. Pharmacopœia of 1870, provided the error be corrected in the relative proportion of potassium iodide and ammonium sulphate, so that for 332 parts of the former 132 parts of the latter salt are used. It is further suggested that the salts be dissolved separately in cold instead of boiling water, and that in the evaporation to dryness the liquid be kept alkaline by the occasional addition of ammonia; with these modifications the process will yield an uncolored salt, which, however is more deliquescent and more readily decomposed on exposure than the salt prepared from pure hydriodic acid and ammonia. Made by the latter process, the salt will cost about 50 per cent. more than when prepared by the modified officinal formula; it is then white and granular, and on exposing small quantities for one or two weeks in a rather moist atmosphere, they remained dry and only began to show signs of deliquescence at the end of that time.

Ten commercial samples of ammonium iodide were procured in different parts of the country for examination. One of these samples contained ·085 per cent. of free iodine. The remaining nine samples were tested qualitatively and the amount of ammonium iodide estimated by decinormal solution of nitrate of silver, using chromate of potassium as an indicator. A definite quantity of the salt was dissolved in distilled water, a little chromate was added, and the liquid precipitated by the volumetric solution until a slight red color

remained permanent. Each cubic centimeter of the silver solution being equivalent to ·0145 gram of ammonium iodide, the amount of pure iodide was readily calculated. The results were as follows:

Weight of salt, gm.....	·0668	·1795	·1905	·0886	·2335	·123	·2045	·2451	·310
Vol. solution, cc.....	4·6	12·35	12·5	6·1	15·8	8·2	14·	16·6	21·3
Pr. ct. of Am I, airdry	99·83	99·76	95·14	99·83	98.11	96·666	99·26	98·20	99·629
" " at 110°C.	99·907	100·	100·	100·	100·	99·675	100·	100·	100·

COMMERCIAL POTASSIUM BROMIDE.

By Julius Way, Ph.G.

From an Inaugural Essay.

When pure, potassium bromide crystallizes in the monometric or regular system, some of the crystals forming nearly perfect cubes which are colorless, but as met with in commerce they are white, owing to the presence of a trace of carbonate. They closely resemble the crystals of potassium iodide, but are entirely destitute of odor. The taste is pungent and saline, but much more agreeable than that of the iodide. Potassium bromide is freely soluble in water, and sparingly soluble in alcohol, requiring for solution about 200 parts of the latter solvent.

Commercial potassium bromide is always contaminated with chloride, it being impossible to entirely free the bromine, from which it is prepared, from chlorine without increasing the cost of the former to a considerable extent. Owing to this fact about 2 per cent. of chloride must usually be admitted in the commercial salt. Ten samples were obtained from different sources and carefully analyzed to determine the presence of impurities. The aqueous solution tested with litmus was found in every case to have an alkaline reaction.

The salts were then qualitatively analyzed. All the samples were found to contain chloride, six a small amount of sulphate and one carbonate of potassium. No metallic impurities were present in either of the samples.

The amout of chloride in each sample was volumetrically estimated by means of a decinormal solution of argentic nitrate, using potassium chromate as an indicator. The manner of determining the percentage of chloride was as follows:

A definite quantity of the salt was dissolved in distilled water and the solution of argentic nitrate gradually added from a burette until the salt was completely precipitated, and the amount of silver solution

required was noted. From this the percentage of chloride was calculated in the following way.

For example, 1 gram of the bromide was used. According to their combining powers, 1 gram of potassium bromide, if perfectly pure, would require for complete precipitation 84·03 cubic centimeters of the argentic nitrate solution. 1 gram of potassium chloride, if perfectly pure, would require for complete precipitation 134·22 cubic centimeters of the argentic nitrate solution. The difference between the volume of silver solution required for the two salts would then be 134·22—84·03=50·19; and since 50·19÷100=·5019 it follows that for each ·5019 cubic centimeters of the silver solution used, above the amount required for pure bromide, 1 per cent. of chloride is indicated. The sample containing carbonate was previously neutralized by nitric acid.

The amount of potassium chloride present was determined to be 1·10, 1·39, 1·55, 1·97, 2·24, 2·25, 3·44, 4·88, 5·98 and 6·92 per cent., or for the ten samples an average of 3·17 per cent.

FERRATED ALBUMEN.

By George Buchner, of Munich.

From the author's investigations and observations on compounds of ferric chloride with albumen we make the following abstracts:

The amount of chloride in egg-albumen was determined by ignition with sodium carbonate and titration with nitrate of silver; 1·6 per cent. Cl was found. The chlorine of the compound was determined in the same manner, deducting the chlorine of the albumen. The iron was estimated by ignition, dissolving in hydrochloric acid, reduction to ferrous salt by zinc, and titration by potassium permanganate.

1. Solution of ferric chloride (1:20) was added to a filtered solution of albumen (1:10) until the voluminous yellowish-brown precipitate was just dissolved. In the clear red-brown liquid albumen as well as ferric chloride responded to the usual reagents. On evaporating this liquid at a temperature not exceeding 50°C. and drying the gelatinous mass at the same temperature, a dark-brown powder or transparent brown-red scales were obtained, only partly soluble in water, the insoluble portion becoming transparent and gelatinous. Analysis: Fe 2·193, Cl 7·980, albumen 89·827 = Fe_2Cl_6 6·354, excess of Cl 3·819.

2. The preceding product was thoroughly washed with water and

the residue dried at 50°C. Analysis: Fe 1·488, Cl 2·700, albumen 95·812 = 4·119 Fe_2Cl_6, excess of iron as $Fe_2(OH)_6$ 0·131.

3. On slowly evaporating the original ferrated albumen solution the liquid becomes turbid, separating a thick jelly, which is soluble in warm water, yielding a clear solution which is not precipitated by boiling. The jelly, well drained, pressed and thoroughly dried over sulphuric acid, yielded Fe 0·998, Cl 4·531, albumen 94·471 = Fe_2Cl_6 2·895, excess of Cl 2·634. The powder was completely soluble in water and the solution was not disturbed by boiling or by alkalies; acids caused a precipitate of albumen, while sodium chloride and potassium sulphocyanide precipitated ferrated albumen.

4. The original ferrated albumen solution was completely precipitated by a saturated solution of table salt; the precipitate was collected upon a filter, drained, pressed, the press cake rapidly washed by agitation with water and decantation, again pressed between bibulous paper and dried over sulphuric acid. The powder swells with water, and dissolves after some time to a solution which is not disturbed by silver nitrate, but is precipitated by potassium sulphocyanide; its composition is Fe 1·703, Cl 1·680, albumen 96.617 = Fe_2Cl_6 2·563, excess of iron as $Fe_2(OH)_6$ 1·566.

5. The original solution of ferrated albumen was mixed with excess of ferric chloride and precipitated by table salt; treated as before, the powder contained Fe 1·15, Cl 1·78, albumen 97·07 = Fe_2Cl_6 2·715, excess of iron as $Fe_2(OH)_6$ 0·41. It behaved to reagents like the preceding. Both if left in prolonged contact with water, while being washed, become transparent, gelatinous and then dissolve.

6. The original solution yields with excess of ferric chloride, on standing, a precipitate which, treated as before, gave a powder containing Fe 1·25, Cl 4·48, albumen 94·27 = Fe_2Cl_6 3·627, excess of Cl 2·103.

7. The original ferrated albumen solution was dialyzed, the water being renewed until silver nitrate ceased to give a reaction. The contents of the dialyser had a neutral reaction and could be readily filtered. The liquid was not disturbed by boiling, by alcohol, caustic alkalies, carbonic acid gas, or silver nitrate. It was colored violet-blue by tannin, and green, without precipitate, by ammonium sulphydrate. Nitric and hydrochloric acid caused a precipitate of albumen, the solution being yellow; lime-water a brownish-yellow precipitate; potassium ferrocyanide a bluish-green precipitate, turning dark-blue on the

addition of hydrochloric acid; potassium ferridcyanide a green precipitate not altered by hydrochloric acid; potassium sulphocyanide a yellowish-brown precipitate, the solution becoming deep red on the addition of hydrochloric acid; sodium chloride a light yellowish-brown precipitate.

The liquid, evaporated at a moderate heat, yielded brown-red, nearly tasteless scales, which retained their solubility in water, the solution on being kept for a year becoming slightly mouldy, but not putrid. The scales contained Fe 1·1715, Cl 0·510, albumen 97·775 = Fe_2Cl_6 0·778, excess of iron as $Fe_2(OH)_6$ 2·765.

It is obvious from the foregoing that these products are readily altered and cannot be of uniform composition unless obtained under precisely identical conditions of temperature, dilution, action of water, etc. It is remarkable that with the entrance of $Fe_2(OH)_6$ into the compound these products become soluble in water and non-coagulable by heat, properties which, together with the peculiar behavior to reagents, are best observed in the dialyzed product, and result from a relatively small amount of iron. The difficulties of studying the nature of such products are increased by the uncertainty of determining the water without altering the composition, and of ascertaining whether definite compounds or mixtures of such are under investigation.

The formation of iron-albuminates may be used for proving the presence of albumen. A very diluted solution of albumen, which is scarcely rendered opalescent by boiling, if mixed with a saturated solution of table salt, yields on the addition of a little ferric chloride, near the point of contact a yellowish-white zone, and on agitation, at first a dense turbidity, changing after a while to a rather voluminous precipitate.

On digesting iron in solution of albumen for a few days a yellowish-brown liquid is obtained, which on evaporation at a moderate heat yields light-brownish red scales, similar in behavior to the dialyzed ferrated albumen; in two cases 1·2 and 2 per cent. of iron was obtained. Freshly precipitated ferric hydroxide dissolves in albumen; the dry product contained 0·65 Fe = 1·24 $Fe_2(OH)_6$. Ferrous hydroxide is very slightly soluble in albumen.—*Archiv d. Pharmacie*, June, 1882, pp. 417–425. J. M. M.

REACTIONS OF THE ACETATES OF CHROMIUM, IRON, AND ALUMINIUM.

By B. Reinitzer.

Ferric and aluminic salts, boiled with a quantity of sodium acetate sufficient to convert them into acetates, deposit the whole of the iron and aluminium as basic acetates, probably in consequence of the resolution of the normal acetates formed in the first instance into basic salts and free acetic acid. Respecting the behavior of chromic salts under similar circumstances, the statements of different authors do not quite agree. Schiff ("Annalen," 124, p. 168) states that when normal chromic acetate is boiled with water, no decomposition takes place; whereas, according to O. Wallach ("Tabellen zur chem. Analyse," 1880), chromic salts, like the salts of iron and aluminium, yield, when boiled with sodium acetate, a precipitate of chromic acetate.

According to the author's experiments a solution of chloride or sulphate, boiled with excess of sodium acetate, yields no precipitate. If the boiling be continuel for a short time only, the solution turns violet on cooling; and in the solution thus altered no precipitate is formed by potash, soda, ammonia, ammonium hydrosulphide or carbonate, sodium phosphate, barium hydroxide, or barium carbonate. Potash, soda, and baryta turn the solution green, and after 12 to 24 hours convert the liquid into a green jelly; ammonia forms a violet jelly. The precipitation is accelerated by heat in all cases except with sodium phosphate, which forms no precipitate, even when aided by heat.

A similar passivity towards the reagents above mentioned is imparted by the chromic solution to a certain quantity of ferric or aluminic acetate. Neither by heating to the boiling point nor by addition of caustic alkalis or ammonia, or their salts, can ferric or aluminic acetate be detected in presence of chromic acetate. In such a mixed solution ammonium sulphide alone produces a slow but complete precipitation of the iron, whereas alumina is not completely precipitated in the cold by any reagent whatever. A given quantity of chromium, however, can protect from precipitation only a limited quantity of ferric oxide or alumina; and, what is especially remarkable, it can protect a considerable quantity only when the chromic solution has been boiled with the sodium acetate before the addition of the ferric or aluminic solution. From these results it follows that, in presence of chromic salts, the method of separation founded on the precipitation of iron and

aluminium in the form of basic acetates, becomes utterly useless, either for qualitative or for quantitative analysis.

The influence of a chromic salt on the precipitation of ferric or aluminic salts varies to a certain extent according as to whether it is in the violet or the green modification. When a green solution of chromic acetate is mixed with a small quantity of ferric acetate, and the mixture is boiled, the iron is separated in the form of a flocculent precipitate; but if a solution of ferric acetate be added to an originally violet solution of chromic acetate and the mixture boiled, then, whatever may be the quantity of ferric solution added, no precipitation of iron will take place. Exactly the same is the case with a violet solution of chromic acetate obtained by boiling a green solution with sodium acetate; also with a green chromic acetate solution boiled without any addition. Green chromic acetate, therefore, acts like most metallic salts when heated, in precipitating a solution of ferric acetate; whereas violet chromic acetate, so far from producing a precipitate, even renders a large portion of the iron acetate as indifferent towards reagents as itself. Thus, when a violet solution or a boiled green solution of chromic acetate is boiled with a moderate quantity of ferric acetate solution, sodium acetate may then be added and the liquid boiled, without precipitation of the iron. Neither is any action produced in such solutions for a long time at ordinary temperatures by any of the reagents—such as caustic alkalis, ammonia, caustic baryta, alkaline carbonates and phosphates, barium carbonate, or potasssium ferrocyanide—which precipitate ferric salts under normal circumstances, precipitation not taking place indeed until after several hours' boiling. The quickest action is produced by ammonium sulphide; but even in this case a decided retardation takes place, as compared with the rate of precipitation in pure solutions of ferric acetate. If the quantity of ferric acetate added exceeds a certain limit, boiling with sodium acetate or addition of caustic ammonia, etc., gives rise to partial separation of the iron.

The quantity of ferric acetate rendered passive by a given quantity of chromic acetate depends upon several circumstances, the most influential of which are the amount of chromic acetate present, the concentration of the liquid, and the temperature at which the acetates act on one another. It increases up to a certain limit with the temperature and the dilution of the solutions, and, so long as the heat is kept below the boiling point, with the duration of the action.

Aluminium acetate is acted upon by chromic acetate in the same manner as ferric acetate, excepting that the aluminium is not precipitated, like iron, by boiling with green chromic acetate. The behavior of the mixed solutions of aluminic and chromic acetates towards sodium acetate, ammonia, and caustic alkalis, is exactly similar to that which is observed in mixtures of chromic and ferric acetates.—*Jour. Chem. Soc.*, Aug. 1882; from *Monatsh. Chem.*

PREPARATION OF SOFT SOAP.

According to Ringel ("Seifenfabrikant," 1881, 82), pure soft soap consists mainly of potassium oleate, potassium carbonate, and the salts contained in the potash used for its preparation. Pure potassium oleate obtained from soft soap by treatment with potassium chloride is a firm, tough, slightly translucent mass. Soft soap does not acquire its translucent appearance and ductile character until after the addition of a solution of caustic and carbonated alkali. Instead of finishing soaps with potash, potassium chloride, sulphate, borate, silicate, etc., may be used; sodium salts, however, produce soaps of less perfection. These salts have the property of causing the soap to combine with water; 100 parts of water require 12 to 15 parts of these salts to effect this combination, so that no watery particles separate on cooling.

For the preparation of green soft soap Starke ("Seifenfabrikant," 1881, 83) uses hempseed oil, linseed oil, and oleïn. The fat is introduced into the copper, mixed with an equal weight of ley of 18° to 20°B. ($\frac{2}{3}$ potash-ley and $\frac{1}{3}$ soda), agitated repeatedly, allowed to settle until the next day, and then heated to boiling. Combination soon takes place, and may be recognized by the absence of oil, which at the commencement floated on the surface of the ley, and by the fact that a sample placed on the tongue no longer tastes of alkali, but has a sweetish taste resembling oil. The mixture is now subjected to gentle boiling, and treated gradually with ley of 20 to 24°B. until a transparent emulsion is produced. At this period the fire is increased and the boiling continued until the soap shows large lamellæ on the sides of the copper, and only very little froth is produced. The soap when finished should remain clear an cooling.

According to Eichbaum ("Seifenfabrikant," 1881, 85), one of the best soft soaps is the so-called "natural grain-soap," which is made from potash ley (containing not more than 5 per cent. of soda) and

German linseed oil. Saponified oleïn and twice purified cotton-seed oil are used in some cases.

Seidemann ("Seifenfabrikant," 1881, 153) describes the preparation of transparent glycerol soft soap. The oils used for the manufacture of this soap must be bleached. In other respects the preparation resembles that of other soft soaps. The bleaching is effected in the following manner: The oil is heated with direct steam and mixed with 5 to 8 per cent. of potash-ley of 28°B. It is agitated thoroughly, then allowed to remain quiescent. The precipitate which subsides is used for the manufacture of darker-colored soaps.

In order to prevent the freezing of transparent soap it is recommended to use linseed oil in its preparation. For washing woolen goods, Menzies ("Seifenfabrikant," 1881, 169) recommends the use of neutral potash soap, which is said to supersede soda soaps.—*Jour. Chem. Soc*, Aug., 1882; from *Dingl. polyt. J.*, vol. 244.

POTASSIO-BISMUTHOUS IODIDE AS A TEST FOR ALKALOIDS.

By F. Mangini.

Dragendorff, in his Manual of Toxicology, recommends this compound as one of the most delicate tests for alkaloids, but adds that it cannot be employed to distinguish one alkaloid from another, as it gives orange-colored precipitates with most of them. The author of the present paper, however, finds that the characters of this reagent vary considerably according to the manner in which it is prepared. When obtained by the process described by Dragendorff,[1] it produces a turbidity even in pure water; but when prepared by mixing 3 parts potassium iodide with 16 parts liquid bismuth iodide and 3 parts hydrochloric acid, it does not give any turbidity with water, and is an extremely delicate test for alkaloids, serving also to distinguish many of them one from the other by the various gradations of color of the precipitates and their alterations after long standing.

The following are the results obtained:

[1] Dragendorff's directions are ("Phar. Zeits. f. Russland," v., p. 82): Dissolve bismuth iodide in warm concentrated aqueous solution of potassium iodide and add of the latter solution a bulk equal to that required for dissolving the bismuth iodide. Editor Am. Jour. Phar.

Strychnine: light yellow precipitate becoming dark yellow after some time; supernatant liquid remains clear.

Morphine: reddish-yellow precipitate which agglomerates at the bottom; liquid remains clear, precipitate disappearing after a few days if the whole is left at rest, and the liquid becoming canary-yellow.

Codeine: immediate, copious, yellowish-red precipitate, remaining for some time suspended in the liquid, and assuming a light brick-red color when left at rest.

Atropine: precipitated at first in filaments, but gradually settling down in the form of a reddish-yellow powder, which if left at rest becomes canary-yellow, and dissolves after some time, coloring the liquid golden-yellow.

Aconitine: precipitated at first in flocks, but suddenly forms at the bottom a chrome-yellow pulverulent precipitate, which does not change color when left at rest, whereas the liquid becomes yellow.

Brucine: precipitated at first in filaments which ultimately settle down with gold-yellow color, becoming paler when left at rest for some time.

Nicotine: immediate red pulverulent precipitate, which suddenly falls to the bottom, and becomes reddish-yellow when left at rest.

Cicutine: precipitate similar in character but of darker color, and becoming dirty-white when left at rest.

Solanine: slowly precipitated with lemon-yellow color, becoming darker on repose and adhering to the bottom of the tube when shaken.

Veratrine: light yellow precipitate forming slowly, remaining suspended for some time, and becoming light canary-yellow when left at rest.

Narceine: light yellow precipitate forming slowly and remaining suspended like that of veratrine, but of deeper color; becomes reddish-yellow on repose.

Quinine Sulphate: immediate brick-red precipitate which suddenly falls to the bottom, and becomes dirty-yellow on repose; remains suspended after agitation.

Cinchonine Sulphate: like the last, but does not fall down so quickly, and acquires a darker color when left at rest.—*Jour. Chem. Soc*, 1882; from *Gazetta*, 1882, p. 155.

PRESENCE OF NICOTINE IN TOBACCO-SMOKE, AND CONSIDERATION OF THE ACTIVE POISON IN THE COMBUSTION-PRODUCTS OF TOBACCO.

By R. Kissling.

Having recognized the toxic nature of nicotine and its action on the nervous system, and the relatively considerable quantity of this alkaloid present in tobacco, it was obviously interesting to ascertain what influence the most important consumption of tobacco, viz., smoking, has on nicotine. Although the number of investigators on this subject is very limited, a complete series of chemical and physiological facts can nevertheless be quoted. Whilst a few investigators indisputably deny the presence of even traces of nicotine in tobacco-smoke, others maintain with equal certainty that it exists in considerable quantity. The author has collected these facts, and the present paper is devoted to a critical discussion of the same, and simultaneously to an account of his own investigations. The following are the details of the principal publications on this subject: Unverdorben ("Pogg. Ann.," 1826, 8, 399) investigated the products obtained by the dry distillation of tobacco. He obtained (1) an etherial oil; (2) an oily acid; (3) an empyreumatic acid; (4) a reddish-brown resinous substance, soluble in potassium hydroxide; (5) a trace of a powdery substance, insoluble in potash and in acids; (6) a small quantity of picoline; (7) a base soluble in water, having a burning taste and unpleasant pungent smell, causing choking; (8) fuchsine; (9) a body resembling the latter; (10) two extractiform bodies.

Zeise ("Annalen," 47, p. 212) was the first who passed tobacco-smoke from a pipe through an aspirator. He found the following constituents: A peculiar empyreumatic oil, butyric acid, carbonic anhydride, ammonia, paraffin, empyreumatic resin, water, a small quantity of acetic anhydride, carbonic oxide, and carburetted hydrogen gas.

Melsens (*ibid.*, 49, p. 353) has investigated the condensation-products of tobacco-smoke with the view of proving the presence of nicotine. He isolated nicotine from this mixture of empyreumatic, oily, tarry, and resinous products, and obtained numbers agreeing with the formula $C_{10}H_{14}N_2$; 4·5 k. of smoked tobacco yielded 33 grams of nicotine.

Vohl (*ibid.*, 148, p. 231), in conjunction with Reichshauer, found sulphuretted hydrogen and hydrocyanic acid in tobacco-smoke. Vohl and Eulenberg ("Vierteljahrsschr. f. gerichtl. und öffentl. Medecin,"

New Edition, 14, p. 249) conclude that nicotine in tobacco is completely decomposed by the smoking process, and that the intense action of tobacco-smoke on the nervous system is attributable to the presence of pyridine bases. The following pure substances were isolated: A hydrocarbon of the formula $C_{38}H_{18}$; pyridine, C_5H_5N; picoline, C_6H_7N; lutidine, C_7H_9N; collidine, $C_8H_{11}N$; parvoline, $C_9H_{13}N$; coridine, $C_{10}H_{15}N$; rubidine, $C_{11}H_{17}N$; and viridine, $C_{12}H_{19}N$. The presence of the following substances was also established: Carbonic anhydride, hydrocyanic acid, sulphuretted hydrogen, formic acid, acetic anhydride, propionic acid, butyric acid, valeric acid, carbolic acid and creasote, several hydrocarbons of the acetylene group, finally ammonia, methane, and carbonic oxide. The presence of caproic, caprylic, and succinic acids could not be determined conclusively.

Heubel ("Centralbl. med. Wissensch.," 1872, 641) has made numerous physiological experiments on tobacco. He concludes that—(1) nicotine is unmistakably contained in tobacco-smoke; (2) by the slow combustion of the nicotine in tobacco, a large quantity is found in the smoke; (3) the fact that in spite of its great volatility and tendency to decomposition, nicotine is largely contained in tobacco-smoke, is explained by the leaves and the smoke containing this alkaloid as a stable salt, and not in the free state.

Le Bon ("la Fumée du Tabac, Recherches Chimiques et Physiologiques") has found the following constituents in tobacco-smoke: Nicotine, ammonia, carbonic oxide, hydrocyanic acid, and two aromatic (not in a chemical sense) substances, one of which is collidine.

Pease ("Jour. Amer. Chem. Soc.," 2, p. 338) analyzed the smoke from 3·6685 grams Havanna tobacco by burning the latter in a long wooden pipe, and passing the smoke through two bottles containing water acidified with sulphuric acid. The filtered and concentrated solution was then tritrated with potassiomercuric iodide. He obtained 0·081 gram nicotine.

In discussing these facts the author mentions that, of the two bases found by Unverdorben in addition to picoline, one probably was nicotine Zeise's investigations are of great importance. It cannot be disputed that by the dry distillation, of tobacco, other products are formed than by the smoking process, as in the latter case a constant or intermittent current of air passes through the tobacco. Referring to Melsens' researches, the author mentions that he is the only investigator who has conclusively established the existence of nicotine in

tobacco-smoke. The quantity of this alkaloid amounts to about 0·7 per cent. of the weight of tobacco consumed, and about 15 per cent. of the total quantity of nicotine contained in tobacco. In conclusion of the first part of his paper, the author criticises the researches of Vohl, Heubel, Le Bon, and Pease. He shows that Vohl's opinion as to the non-existence of nicotine in tobacco-smoke is without foundation. This chemist evidently disregarded the fact that nicotine is decomposed by warm potassium hydroxide. The remaining three publications cannot be regarded as a satisfactory solution of the whole question of controversy of opinion, as they are very incomplete.—*Jour. Chem. Soc.*, Aug. 1882; from *Dingl. polyt. J.*, vol. 244.

SOLUBLE SALTS OF CAFFEINE.

By C. Tanret.

Hitherto, in consequence of its slight solubility, caffeine has been administered hypodermically only in very small doses; in fact, at the ordinary temperature, it requires 93 parts of water to dissolve it, so that a cubic centimeter would contain scarcely more than a centigram. Most of the salts of caffeine mentioned in therapeutical works do not exist, and those that do cannot be employed, because upon being dissolved they are decomposed into acid and caffeine, the latter being precipitated if the water is not in the proportion required for the solution of the free alkaloid.

The alkaloidal properties of caffeine are extremely weak; it is perfectly neutral in its behavior towards litmus, while the ordinary reagents for alkaloids do not precipitate it unless its solutions are relatively very strong. Not being alkaline, caffeine is incapable of saturating the smallest quantity of acid, and although it forms salts with certain acids these salts are far from being as stable as those of most of the other alkaloids, as will be seen upon considering its behavior with the acids most frequently employed.

Acetic acid dissolves caffeine freely. If this solution be allowed to evaporate spontaneously the acid volatilizes entirely and there remains, not a salt of caffeine, but pure caffeine. An acetate of caffeine, therefore, does not exist.

Neither does valerianic acid form with it a valerianate of caffeine. If caffeine be saturated hot with a very strong solution of this acid,

upon cooling it will deposit, not valerianate of caffeine, but simply caffeine, entirely soluble in chloroform and only retaining mechanically traces of the acid, sufficient to impart the odor. The acid titrate of the solution remains the same as before the addition of the caffeine, which proves clearly that the caffeine has not carried down with it a sensible quantity of the acid in its precipitation. Also when caffeine and valerianic acid are placed together under a bell glass, as in the preparation of valerianate of ammonia, the caffeine only becomes impregnated with the odor of the acid. I have verified this fact upon commercial "valerianate of caffeine" occurring in fine crystalline needles resembling those of caffeine, a character that was very natural, since it was only caffeine with a valerianic odor. Exposure to the air and simply washing removed this odor.

Lactic acid does not combine with caffeine to form a lactate. Syrupy lactic acid, saturated in the cold with caffeine remains syrupy indefinitely; and, as in the case of valerianic acid, pure caffeine crystallizes out upon the cooling of a lactic acid solution that has been saturated while hot.

It is the same with citric acid, which does not give a citrate. The product which is decorated with this name is only a mixture of caffeine and acid.

Another circumstance goes to prove further the non-existence of these pretended salts of caffeine and organic acids. Whilst, for example, citric acid, which is tribasic, requires for the formation of citrates three equivalents of base, one or two of which can be replaced by one or two equivalents of water, there is required to effect the solution of one equivalent of caffeine in water a quantity of acid represented in weight by about three equivalents of acid. The relations are, therefore, precisely the inverse of those which should obtain in the formation of a citrate. To sum up, organic acids do not form definite salts with caffeine. They augment, it is true, its solubility in water, but without combining with it, and since the acidity of the acids is in no way modified by caffeine, it will be evident that with solutions of caffeine in organic acids there would be injected a quantity of free acid several times the weight of the dissolved caffeine.

With mineral acids the conditions are different. Sulphuric acid forms with caffeine a sulphate that crystallizes with difficulty. Hydrochloric and hydrobromic acids on the contrary form salts that are easily obtainable in very fine crystals. These salts are perfectly defi-

nite and have been described; but they are not stable, and water decomposes them into free acid and caffeine, which precipitates or not according to the quantity of water employed. They are also altered by the air, and the crystals of the hydrochlorate when exposed effloresce rapidly, losing their acid. After a time, more or less long, according to the temperature, nothing remains but caffeine. Therefore, from this point of view, the salts of caffeine formed with mineral acids do not present any advantage over pure caffeine.

In presence of these negative results, I had the idea of employing the natural salt which holds the caffeine in combination in coffee, the chlorogenate of potash and caffeine of Payen. But that salt is very difficult to obtain in any considerable quantity, and this presents an obstacle to its employment in the ordinary way, besides which when in solution the salt is very alterable in the air. Moreover it contains only 29 per cent. of caffeine, and in the cold requires to dissolve it several times its weight of water, which gives solutions still less charged with caffeine.

It occurred to me then, in view of the apparent similarity that exists between chlorogenic or caffetannic acid and benzoic, cinnamic and salicylic acids, that double salts analogous to Payen's salt could be formed with the three last-named acids, and my conjecture proved correct.

In the presence of benzoate, cinnamate or salicylate of soda caffeine dissolves in a very small quantity of water and forms thus very soluble double salts that are very rich in caffeine. That there is in this case more than a simple solution is proved by the fact that for a definite weight of caffeine there is required a definite weight of the alkaline salt; in other words, combination takes place according to the equivalents of these various bodies. But this combination is rather weak, since if the salts be treated with chloroform they give up to it all their caffeine. In my opinion these double salts may be best compared with hydrated salts, which lose their water of crystallization when treated with a neutral liquid in which water is soluble. In this way blue sulphate of copper loses its water of crystallization and becomes white when immersed in absolute alcohol.

Cinnamate of soda dissolves caffeine in water equivalent for equivalent, 170 parts of cinnamate for 244 of caffeine. The double salt thus obtained contains 58·9 per cent. of caffeine.

Benzoate of soda and caffeine contains for two equivalents of ben-

zoate of soda (288), one equivalent of caffeine (244), or 48·5 per cent. of caffeine.

The double salt richest in caffeine can be obtained with salicylic acid. An equivalent of salicylate of soda (160) allows of the solution of an equivalent of caffeine (244), which gives 61 per cent. of caffeine in this double salt.

The solubility of these double salts is such that solutions can be easily obtained with the benzoate and cinnamate of soda containing 20 centigrams per cubic centimeter, and with salicylate of soda as much as 30 centigrams.

Benzoic, cinnamic and salicylic acids having supplied me with what I was in search of, I have not thought it necessary to ascertain to what extent analogous results might be obtained by employing those acids in combination with other bases than soda. I may mention, however, that I have been able to obtain double salts with acetic, lactic, citric, sulphuric and hydrochloric acids.

With these new salts, therefore, it will be possible in future to administer caffeine hypodermically. It is true that the alkaline salts associated with it have their own peculiar action; but this action is known, and consequently it will, according to the case and the dose, sometimes be ignored and sometimes taken account of; that will be a matter of therapeutics.

In conclusion, these salts may always be prepared extemporaneously by simple solution in water in the proportions given above. But since the commercial benzoate of soda has sometimes an alkaline reaction, it will be as well, in preparing hypodermic injections, to first neutralize the soda salts with the corresponding acids.—*Phar. Jour. and Trans.*, Aug. 5, 1882, from *Jour. de Phar.*. 1882, v. 591.

THE ACTIVE PRINCIPLE OF ADONIS VERNALIS.

By Dr. V. Cervello.

The use of the Ranunculaceous plant, *Adonis vernalis*, L., in some forms of heart disease has led to some physiological experiments from which it would appear that it is capable of exercising an action similar to that of digitalis, with the advantage that it is not cumulative, its administration during a considerable time being without danger. But hitherto nothing definite has been known with respect to the constituent

or constituents of the plant to which the action is due. The author, as a result of a chemical investigation of the plant, states that it contains only one active constituent, a glucoside, which he has named "adonidin."

In the preparation of adonidin the plant is cut into small pieces, which are macerated during two days in dilute (50 per cent.) alcohol; the liquid is filtered, the filtrate treated with basic acetate of lead, separated from the resulting precipitate by decantation and evaporated on a water-bath to a syrupy consistence. The residue, which is very bitter and has an acid reaction, is carefully made slightly akaline by the addition of ammonia solution, and then heated with a strong solution of tannic acid, which is added as long as any precipitate is formed. The precipitate is a compound of the active constituent and tannic acid, difficultly soluble in water. This is collected on a filter, washed with a small quantity of water and dried between paper. To decompose this tannic acid compound zinc oxide and some alcohol are added and the whole is heated in a water-bath until the liquid is evaporated, when the mass is treated with strong alcohol, filtered and the residue on the filter washed with much alcohol. The filtrate is yellow and contains the adonidin not quite pure. To purify it the solution is evaporated by a gentle heat to a small volume and ether added, when inactive colored matter is precipitated together with a trace of adonidin. Upon evaporation of the mixture of alcohol and ether by a moderate heat a residue is obtained, which represents pure adonidin and is finished by drying in a vacuum over sulphuric acid.

The quantity of adonidin obtained in this way, from two kilograms of *Adonis vernalis* was small; this the author does not consider due to any defect in the method of preparation, but to the fact that the compound, which is extremely energetic, is contained in the plant in relatively small proportion.

Adonidin is non-nitrogenous, colorless, odorless, amorphous, and extremely bitter. It is soluble in alcohol, but only slightly so in ether and in water. It is precipitated by tannic acid, the precipitate redissolving in much water. It is insoluble in dilute hydrochloric acid in the cold, but on being heated with the dilute acid it splits up into sugar and a substance insoluble in ether.

The author is not in a position to say whether the decomposition product has any action upon the organism, analogous to the case of

digitaliretin, obtained under similar conditions from digitalin by Schmiedeberg.

With respect to the physiological action of adonidin the author sums up the results of his experiments by stating that it may be described as identical with that of digitalin, with the single exception that it is far more powerful. He also confirms the statement that it is not cumulative.—*Phar. Jour. and Trans.*, Aug. 12, 1882; *Arch. f. exper. Path. u. Pharmak.*, xv.

QUASSIIN.

By A. Christensen.

The literature upon the chemical constituents of quassia wood is very inconsiderable. In 1806 Thomson ("System der Chemie," iv, 47,) mentioned that by digesting quassia wood with water and evaporating he obtained a very bitter substance, which when warm was soft, and became brittle upon cooling, and which, in his opinion, consisted principally of the pure bitter constituent; it gave a slight precipitate with tincture of galls. In 1811 it was stated by Pfaff ("System der Materia Medica") that the bitterness was completely extracted by cold water. In 1826 Buchner introduced 1 grain of the alcoholic extract into a wound in a rabbit, which was followed by the death of the animal. Another investigation of the extract by Keller (Buchner's "Repertorium," ii) contains nothing of importance.

Quassiin was first prepared by Winckler (Buchner's "Repertorium," liv. [1837], 85, and lxv. [1389], 74) in 1835 as follows. Three ounces of quassia wood were extracted with 2 pounds of 80 per cent. alcohol. After evaporation in a water-bath the residue was dissolved in water, and the solution filtered and evaporated to the consistence of an extract. The extract was exhausted with absolute alcohol, evaporated almost to dryness, and then again exhausted with boiling water. The light-yellow solution, decolorized by animal charcoal, left after slowly evaporating crystals of quassiin. Winckler described this substance as crystalline, difficultly soluble in water and freely in alcohol, faintly alkaline, giving a precipitate with tannic acid, and as being obtained crystalline most easily from water.

Subsequently Wiggers ("Annalen der Pharmacie," xxi [1837], 40,) prepared quassiin by repeatedly boiling 8 pounds of quassia wood with water, evaporating the filtered decoction to 6 pounds, cooling, adding lime and allowing the mixture to stand a day with frequent shaking

filtering, evaporating nearly to dryness and then boiling with 90 per cent. alcohol. From the solution, which according to Wiggers contained, besides quassiin and coloring matter, some sodium chloride and potassium nitrate, the alcohol was distilled off and it was then evaporated to dryness. The residue was dissolved in the least possible quantity of alcohol and mixed with a considerable quantity of ether, which separated much coloring matter. The filtrate was now again evaporated, and dissolved in absolute alcohol and ether and this repeated until the residue was colorless and free from saline matter. Lastly the etherial solution was poured into a small quantity of water and left to evaporate spontaneously.

Wiggers found for quassiin the formula $C_{20}H_{25}O_6$. According to him it loses 1·3 per cent. of water at 100°C., and 0·37 per cent. more upon fusing. The melting point, he says, lies a little above that of the resin. He found it dissolve in 220 parts of water at 12°C., and it did not neutralize acids. It crystallized by spontaneous evaporation from a solution in alcohol and ether which was mixed with water, and also when a warm saturated alcoholic solution was mixed with boiling water and allowed to cool. The quassiin of Wiggers was precipitated by tannic acid, but not by metallic salts.

In commencing the present investigation, Herr Christensen first directed his attention to find a new method of preparation, since the methods of Winckler and Wiggers yielded it in a very impure condition and the operations for its purification would involve considerable loss. The author tried two methods that are available in the extraction of several bitter substances: (1) treatment of a solution of the watery extract with bone black and exhaustion of this with alcohol; and (2) precipitation of the watery extract with tannic acid, decomposition of the washed precipitate, extraction with alcohol, etc. In both cases, by evaporating slowly, he obtained tabular crystals, having an intensely bitter taste, leaving on combustion no ash, difficultly soluble in water and fairly soluble in alcohol. The solutions gave with tannic acid a dense white precipitate.

Notwithstanding that the quassiin is tolerably completely removed by bone black, as is shown by the fact that the filtrate tastes only slightly bitter, the tannic acid method has the advantage that it yields the purer product. The following method was adopted by the author for the preparation of quassiin:

Five kilos of quassia were boiled several hours with two successive

quantities of water. The united filtrates were evaporated, at first over an open fire, subsequently on a water-bath, to 1½ liter. After cooling this was filtered and the filtrate precipitated with tannic acid, taking care to keep the reaction neutral or faintly acid by the addition of carbonate of soda, since the compound of quassiin with tannic acid, like many similar compounds of bitter substances with that acid, is very soluble in it. The precipitate, after the addition of well-washed pipe-clay is easily collected and removed by filtration. The precipitate after being repeatedly washed was mixed whilst moist with a considerable quantity of freshly precipitated lead carbonate, and evaporated to dryness in small portions, with frequent stirring, upon a water-bath. The mixture was extracted four times with alcohol, the alcohol distilled off and the residual liquid evaporated until the separation of crystals of quassiin, which were washed and dried between filtering paper. The filtrate yielded more crystals upon further evaporation, and some more quassiin was separated by shaking it with chloroform. Lastly, the quassiin was recrystallized from ether-alcohol and water.

In the place of lead carbonate, calcium hydrate also was used for the decomposition of the tannic acid compound, and an alcoholic solution obtained that was not so much colored, but the yield was smaller.

Upon evaporating the watery extract of quassia wood, a considerable precipitate separated as a smeary mass. This was treated with freshly precipitated lead carbonate, evaporated almost to dryness and extracted with 84 per cent. alcohol. After the alcohol had been distilled off, and the liquid sufficiently evaporated, some quassiin separated, but in an impure condition.

Quassiin is very freely soluble in chloroform, and by shaking an aqueous solution of it with chloroform it can be nearly entirely removed. The author therefore tried to obtain the quassiin from the aqueous extract of quassia wood by simply shaking this with chloroform; but the practical difficulty was met with that the chloroform does not completely separate it, and a pasty, slimy mass was formed, the consistence of which was not altered even upon warming. After the chloroform had been distilled off a very impure residue was left, from which the quassiin was only obtained by repeated recrystallizations from ether-alcohol mixed with a little water. Neither can direct exhaustion of the quassia wood by chloroform be adopted in the preparation of the quassiin, since much resin is taken up with it, and this

can only be separated by the ether-alcohol method, which involves considerable loss. The last two experiments show, however, that quassiin exists as such in the wood, and is not a product formed during the treatment.

The quassiin, obtained as above described with tannic acid, was purified by recrystallization from the smallest possible quantity of warm alcohol, in which it is so much more soluble than in cold that the solution solidifies into a paste upon cooling. After the crystals had been washed with dilute alcohol and dried between filter-paper and then over sulphuric acid they were white and gave a colorless solution. They were recrystallized once more by the addition of boiling water to a hot concentrated alcoholic solution; the crystals that separated on cooling showed the same melting point as those of the first crystallization and were used in the further experiments.

With respect to the proportion in which quassiin occurs in the wood, the author obtained from 18 kilos of Jamaica wood ("Picræna excelsa") 12 grams of impure substance, equal to 0·6 per 1,000. But in treating a subsequent consignment, both of Jamaica and Surinam wood, he found to his surprise that in repeated experiments upon considerable quantities of both kinds he could obtain scarcely any quassiin. A sample of Quassia amara wood, that yielded 2·8 per cent. of extract, and one of Picræna excelsa wood, that yielded 2·6 per cent., yielded no quassiin. The sample of Picræna excelsa wood that gave 0·6 per 1,000 of quassiin yielded 3·2 per cent. of extract. The author is unable to explain the cause of this difference; but if the value of quassia wood is dependent upon the proportion of quassiin it contains, the results do not afford much justification for the exclusion of the Jamaica wood from some pharmacopœias.

Pure qnassiin forms very thin rectangular double refracting crystalline scales. It has an intensely bitter taste, is without smell, permanent in air, and gives neutral solutions with alcohol, water, etc. It melts at 205° with slight puffing—possibly due to the giving off of water—to a yellow resin-like mass, which upon solution and recrystallization is recognized as unaltered quassiin.

Water left in contact with finely powdered quassiin several days, with frequent shaking, at 15°C., dissolved 1 part in 1,230. A warm saturated solution left forty-eight hours at 15°C., with frequent shaking, contained 1 part in 735. Boiling water dissolves quassiin with difficulty, but much more freely than cold. In alkalies it

dissolves with a yellow color very readily upon boiling and separates unaltered on the addition of acids, becoming again colorless. It is dissolved by alkalies in the cold somewhat more easily than by water, turbidity resulting upon neutralizing the liquid with acids. Boiling alcohol dissolves it very freely, but cold alcohol much less so, 1 part of quassiin requiring 30 parts of 84 per cent. alcohol at 15°C. In ether and petroleum spirit it dissolves with difficulty, but very freely in chloroform, of which 2·1 part dissolve 1 part of quassiin. A solution in chloroform is dextrogyre, the specific rotation being $a_d + 37{\cdot}8$.

Quassiin contains no nitrogen. After being dried to a constant weight over sulphuric acid, it did not alter in weight when exposed for an hour to a current of dry air at 100°C., and gave upon analysis results corresponding with the formula $C_{31}H_{42}O_9$.

	Calculated.	Found.
C	66·66	66·90
H	7.52	7·44
O	25·82	25·65

An aqueous solution of quassia is not rendered turbid by metallic salts. A saturated alcoholic solution gives no precipitate with a similar solution of neutral lead acetate, and upon evaporation the quassiin separates unaltered. Other saturated alcoholic solutions of metallic salts behaved similarly. Tannic acid produces in aqueous and alcoholic solutions of quassiin a white precipitate which is soluble in acids and in caustic and carbonated alkalies.

Dilute hydrochloric and sulphuric acids dissolve quassiin in the cold somewhat more freely than water, but 3 to 10 per cent. solutions, even after being heated in sealed tubes to 125° for an hour, did not reduce alkaline cupric tartrate, showing that quassiin is not a glucoside.

By treatment of quassiin with a 3 per cent. solution of sulphuric acid a new compound was obtained, crystallizing in fine needles, and having only a slightly bitter taste. It melted at 237°C., did not lose all its water of crystallization (four molecules) till 110° C., and when anhydrous gave upon analysis results corresponding with the formula $C_{31}H_{38}O_9$. It was very sparingly soluble in water, required 180 parts of alcohol at 15°, dissolved very freely in caustic potash and caustic soda, and gave no precipitate with tannic acid. There was also a formation of resinous matter that could not be crystallized and possessed an intensely bitter taste.

A strong solution of quassiin in chloroform decolorizes bromine, with formation of hydrobromic acid. The author obtained a bromine

compound as a white amorphous mass, with a taste even more bitter than that of quassiin; this compound dissolved in alkalies with an intense yellow color, distinctly produced by the smallest traces, and at the same time lost its bitter taste almost completely.

An experiment made to test statements as to the occurrence of an essential oil in quassia wood gave negative results, a small quantity of solid white substance that collected on the surface of the aqueous distillate proving to consist of free fatty acid.—*Phar. Jour. and Trans.*, August 19, 1882, from *Archiv.*, xx, 481.

THE PURIFICATION OF COMMERCIAL ALCOHOL.

By A. Riche.

It is known that in fermentation sugar does not split up exclusively into alcohol and carbonic anhydride, according to the equation of Gay-Lussac, and Pasteur has shown that glycerin and succinic acid are constantly formed during the alcoholic fermentation. Many others besides these four products make their appearance at the same time, several of which are not yet defined, but mention may be made of most of the alcohols and acids of the fatty series; the aldehydes, their isomers and various derivatives; and isopropylic acid.

Alcohol is now manufactured from the most varied materials; fresh and dried grapes; beetroot and beetroot molasses; various grains, such as barley, rye, maize and rice; saccharine fruits, as figs, dates, plums, and mulberries; and several starches. Some of the bodies contaminating commercial alcohol are derived from the material used as the source of the alcohol, and are only met with if the alcohol is derived from a particular material.

The temperature to which the fermented liquor is subjected in the distillatory columns also determines the formation of contaminating products, and notably of substances possessing a disagreeable odor and taste; so that the number of compounds affecting the purity of alcohol is very large and very diverse in nature. In weight they only represent a very small portion of the alcohol, but this quantity is nevertheless sufficient not only to give the alcohol a special flavor, but also to render it more injurious for consumption than pure vinic alcohol.

It is, therefore, very important to free the alcohol from these impurities. At first it was hoped that this could be done by several rectifications, and M. Pierre effected it by frequently repeated operations

conducted at the lowest possible temperature. But on a manufacturing scale this is impracticable, because the distillatory columns are heated strongly and for a long time, so as not to leave any alcohol in the residues: at most one-third of the product would be alcohol of good flavor, and that would be still far from pure.

At the commencement of the distillation the first runnings consist of alcohol having a bad flavor (*mauvais goût de tête*) due especially to aldehydes and alcohols; then the runnings become less impure (*moyen goût de tête*). Alcohol of good flavor is collected towards the middle of the operation, and the remainder constitutes the last runnings (*moyen goût de queue* and *mauvais goût de queue*), which contain the higher alcohols and empyreumatic oils.

Attempts have been made to purify the alcohol by means of wood and animal charcoal, but with very imperfect results. Oxidation, both by treatment with various oxidizing bodies, and by the action of a current of air has also been tried, but with indifferent success, in consequence of the loss of alcohol. Considering the fact that the most active and odorous of the contaminating compounds are aldehydes,—vinic, butylic, amylic, etc.,—M. Naudin conceived the idea of getting rid of them by a process of hydrogenation, and this he has carried out practically by means of the copper-zinc couple.

If a plate of zinc be immersed in a solution of a salt of copper it becomes covered with a metallic deposit, and eventually constiutes a true copper-zinc couple, in which the copper exists in a finely divided state. Thus prepared the couple is capable of decomposing pure water, with evolution of hydrogen and formation of hydrate of zinc. It can consequently act freely in neutral liquids, and constitutes a powerful agent of hydrogenation. If an alcoholic distillate indicating 40 to 65 alcohometric degrees be brought into contact with such a couple in action it is found that the hydrogen evolved is absorbed and that the odor and taste of the distillate disappear rather rapidly. The distillates of maize and beet molasses thus hydrogenated, when rectified in the ordinary apparatus, show an augmentation of 25 to 30 per cent. of good flavored alcohol over the old yields.

In the apparatus of M. Naudin zinc cuttings are placed in successive beds of 15 to 20 centimeters in thickness, supported on wooden diaphragms pierced with holes in a vat made of wood, copper, or iron. At the commencement of the operation a sufficient quantity of 5 per cent. solution of sulphate of copper is run into the vat. The decolora-

ration of the cupric solution marks the completion of the precipitation of the copper in a pulverulent state upon the zinc cuttings, and the couple is then ready for work. The resulting solution of sulphate of zinc is run off, and the vat is filled with the distillate to be purified.

By a special arrangement, the alcohol is kept circulating in the vat, but the time required for it to remain in contact with the couple is not always the same. This necessarily depends upon the degree of contamination in the product to be purified, the temperature at which the hydrogenation takes place, and the condition of the couple. Temperature, especially, has a considerable influence upon the rapidity of the reaction; for instance, a sheet of zinc covered with precipitated copper gave in one hour at 2·2°C. 1·2 cc. of hydrogen, and at 98°C. in the same time 528 cc. The temperature of the liquor in the vat is controlled by a worm through which hot water or steam can be passed. When the hydrogenation is completed, the distillate is passed on to the rectifying column.

The hydrogenating action of metallic couples is generally sufficient for the entire purification of the distillate, and in the case of distillates from grain and beet molasses, the increase in the yield of good flavored alcohol in the first runnings is 25 to 30 per cent.

But this treatment, although sufficient for many distillates, does not sufficiently improve those obtained directly from beet, and in these cases M. Naudin completes the action by electrolysis by means of electric machines. The distillate from the beet is first left in contact with the copper-zinc couple a sufficient time (two days or more) to ensure its complete hydrogenation and then, nearly purified, but having still a slight flavor of its origin, it is acidulated by means of sulphuric acid and sent into a special arrangement of voltameters. The number of voltameters coupled varies with the intensity of the action required, and the quantity of distillate to be purified. In practice, in a factory running 6,000 or 7,000 gallons daily, twelve voltameters are in couple, and the electrolytic action is regulated by disconnecting or placing in circuit the required number. It is evident that in this operation there must be some oxidizing action, and to this extent it would appear to be open to the same objection as the processes based upon oxidation.

M. Pictet has recently announced that he effects the purification of alcohol by rectification carried on at a low temperature, and that this operation is carried on in a large scale in Paris. The distillates, or

even the musts, are placed in a large boiler surmounted by a rectification column, above which rises a condenser surrounded with cold water, which condenses the less volatile products so that they run back into the boiler. The vapor not condensed here passes into a refrigerator, surrounded with cold water, where they are completely condensed. The first runnings (*goûts de tête*) are collected in a receiver; next comes the good flavored alcohol, which is then run into a second boiler.

The first still is connected with an air pump, by which a more or less complete vacuum can be produced, and the temperature thus regulated. In the second still a nearly complete vacuum is produced, so that the temperature falls quickly. The vapor which issues from it consists of nearly pure nlcohol, because the few foreign bodies which pass into the first distillation do not give off vapor at the temperatures, varying between —10° and 5° which obtain in this part of the apparatus.

The vapor of alcohol thus purified rises into a second rectification column, terminated by a refrigerator cooled by liquid sulphurous anhydride, in which is maintained a temperatnre between —25° and —50°. The first portion is collected in a special vessel and withdrawn; the remainder is pure alcohol.—*Phar. Jour. and Trans.*, Aug. 5, 1882; from *Journal de Pharmacie*, 1882, v, 480.

Glyceroborates of calcium and sodium are recommended by Le Bon as antiseptics. They are prepared by heating together, with constant stirring, equal parts of borate of calcium or sodium and glycerin, until a drop removed and placed on a glass plate forms a brittle transpaparent pearl. Upon being poured out to cool the product forms a transrent glassy mass, soluble in alcohol and water, which, being very hygroscopic, is broken into fragments and kept in stoppered bottles. The glyceroborate of sodium is soluble in water in all proportions, and even in dilute solution is said to be a powerful antiseptic, though so non-irritating that a concentrated solution may be applied to the eye and other delicate organs without inconvenience. A simple coating of meat with a varnish of glyceroborate is said to be sufficient for its preservation. The similarity of these bodies to another recently referred to in these columns is obvious.—*Phar. Jour. and Trans.*, July 29. (*Compt. rend.*, xcv, 145).

SOLUBLE AND INSOLUBLE MODIFICATIONS OF THE GASTRIC FERMENT.

By A. Gautier.

Solution of pepsin from the sheep, filtered twice through paper, and then through biscuit porcelain, still retains the property of rapidly dissolving fibrin, and converting it completely into peptone. It has, however, only about half the digestive power of the unfiltered liquid. This soluble pepsin has also the property of fixing itself on fibrin in an insoluble form, as recently observed by Wurtz. The portion left on the filter, after prolonged washing, consists mainly of rounded or ovoid refractive corpuscles, about one-tenth or one-twelfth the diameter of the globules of beer yeast. They have a somewhat slow, non-brownian motion, and are frequently associated in pairs, in which condition they appear to be more mobile. They are accompanied by numerous agglomerations of brilliant immobile corpuscles, together with crystals of ammonium magnesium phosphate, fatty globules, and here and there very small bacteria: 0·086 gram of the dry insoluble matter was obtained from 4 grams of pepsin. This insoluble portion, in presence of dilute hydrochloric acid, has a power of dissolving fibrin six times greater than that of the unfiltered pepsin, but the process of digestion is not complete, even after a long time, the fibrin being converted into intermediate products, which are precipitated by nitric acid. The insoluble particles are probably protoplasmic granules from the peptogenic cells. The insoluble granules obtained from pepsin are gradually but slowly converted into the soluble modification in presence of pure water. This affords proof of Béchamp's supposition ("Compt. rend." 94, p. 582) that pepsin is a product of these gastric microzymas, as he terms the insoluble granules. The author is, however, unable to agree with Béchamp that these granules are living organisms which have the power of secreting pepsin. He regards them as a purely chemical ferment, without organization and without life, and bases this conclusion on the following facts. The granules show no signs of organized structure under the highest magnifying power; they do not propagate even under most favorable conditions; they digest albuminoids in presence of poisons which completely check the activity of organized ferments, especially such as are of the nature of vibrioles, and they act only in presence of free acids, whereas bacteria and their germs require a neutral or alkaline medium.

The insoluble granules can be easily obtained from the mucous membrane of a pig's stomach from which all mucus has been removed. Thus obtained their properties agree with those of the *gastric microzymas* of Béchamp.—*Jour. Chem. Soc.*, July, Aug., from *Compt. rend.*, vol. 94.

TWO ISOMERIC DIBROMOCAMPHORS AND MONOBROMOCAMPHOR.

By J. Kachler and F. V. Spitzer.

Monobromocamphor, discovered by Perkin in 1865, forms colorless monoclinic crystals, melts at 76°, boils without decomposition at 274°, and is reconverted into camphor by the action of alcoholic potash, or by heating it in alcoholic solution with sodium-amalgam. R. Schiff, by heating it with nitric acid, obtained a crystalline substance, $C_{10}H_{14}NO_3$, which he regarded as bromonitrocamphor.

By the further action of bromine monobromocamphor is converted into dibromocamphor, the statements respecting which by different authors exhibit considerable divergencies, due, as the following experiments will show, to the existence, not previously suspected, of two isomeric dibromocamphors (α and β).

α-Dibromocamphor is obtained by heating 1 mol. monobromocamphor with 1 mol. bromine in sealed tubes at 120°, and separates from the resulting syrupy liquid as a crystalline mass, which dissolves with moderate facility in alcohol, and is deposited therefrom in prismatic needles melting at 61°.

β-Dibromocamphor is obtained by heating monobromocamphor with bromine in the ratio of $C_{10}H_{15}BrO$ to 3Br for six or eight hours in sealed tubes at 120 to 125°, whereby a brown sprup is formed, which slowly deposits crystals, and when mixed with absolute alcohol, immediately yields a pulverulent crystalline mass, only slightly soluble in alcohol, even at the boiling heat, and separating from the solution in thick rectangular plates, having also the composition $C_{10}H_{14}Br_2O$, but melting at 114 to 115°. The mother-liquor contains monobromocamphor. The β-modification of dibromocamphor is also formed by heating the α-modification with 2 at. bromine in sealed tubes at 120 to 125° for six to eight hours. A red laminar sublimate then forms in the upper part of the tube, apparently consisting of an unstable compound of $C_{10}H_{14}Br_2O$ with bromine, which it gradually gives off,

leaving *α*-dibromocamphor (m. p. 61°). The greater part of the product, however, is a brown-red viscid liquid, which, when mixed with alcohol, immediately deposits a crystalline powder, having, after recrystallization from alcohol, the composition $C_{10}H_{14}Br_2O$, and melting at 114—115°, which is the characteristic melting point of *β*-dibromocamphor.

The differences between the two modifications of dibromocamphor are shown in the following table:

	α	*β*
Crystalline form.....	Rhombic: $a:b:c=0{\cdot}7925:1:0{\cdot}5143$. Observed faces, $\infty P_{\breve{\infty}}$, $P_{\breve{\infty}}$, $P\bar{\infty}$, ∞P.	Rhombic: $a:b:c=0{\cdot}9501:1:1{\cdot}35206$[2] Observed faces, ∞P, $P_{\breve{\infty}}$, $\infty P_{\breve{\infty}}$.
Solubility.....	Very soluble in alcohol, ether, ethylacetate, and light petroleum.	Sparingly soluble in alcohol, ether, ethyl acetate and light petroleum.
Alcoholic potash.....	Monobromocamphor, and finally camphor,	Oil smelling like turpentine, and distilling between 150° and 230°.
Nascent hydrogen from sodium-amalgam with dilute alcohol.	Monobromocamphor; finally camphor.	Hydroxycamphor, $C_{10}H_{15}(OH)$, boiling at 258—260°.
Nascent hydrogen from sodium-amalgam and ether saturatad with hydrochloric acid, in etheric solution.	Camphor.....	Camphor.
Sodium and carbonic anhydride.	Camphocarboxylic acid, $C_{11}H_{16}O_3$,[1] melting at 123 to 124°.	Resinous masses.
Phosphorus pentachloride	No reaction.....	No reaction.
Fuming nitric acid.....	Nitrogen and a brominated oil.	Dibromononitrocamphor, $C_{10}H_{13}Br_2NO_3$, m. p. 126°.

—*Jour. Chem. Soc.*, Aug., 1882, p. 864; *Monatsh. Chem.*, iii.

[1]Misprinted in the original $C_{20}H_{32}O_6$.

[2]The figures given by Zepharovich is 0·5206. *Jour. Chem. Soc.*, 1882, p. 865.

DICHLOROCAMPHOR.

By P. Cazeneuve and Didelot.

Camphor is dissolved in absolute alcohol, and treated with a current of dry chlorine for several hours at 80 to 90°. Heat is developed and hydrochloric acid is given off in large quantity. The product is repeatedly treated with water, and heated then to remove chloral and hydrochloric acid. On cooling, it solidifies to a crystalline mass, which may be purified by crystallization from alcohol. The *dichlorocamphor*, $C_{10}H_{14}Cl_2O$, thus obtained forms large white oblique prisms, slightly soluble in cold, but very soluble in hot alcohol; soluble in ether, in the vapor of which it liquefies, but insoluble in water. It softens at 89°, and melts at 93°, at which temperature it gradually volatilizes without decomposition. Above 150° it blackens and decomposes with evolution of hydrochloric acid. On continued heating, the temperature rises to 263°, at which point it remains constant, and a colorless liquid distils over.

The formation of the dichlorocamphor is probably preceded by that of the monochloro-derivative. No higher derivative is obtained by the prolonged action of chlorine at the temperature of the experiment.

Dichlorocamphor is insoluble in water, but imparts to it its peculiar odor. When placed on the surface of water, it exhibits gyratory movements, similar to those of camphor. It is insoluble in cold, but readily soluble in hot alcohol, in chloroform, carbon bisulphide, and ether. The ethereal solution crystallizes with difficulty, and the ether appears to form a molecular combination with the dichlorocamphor. The latter, unlike camphor, is insoluble in acetic acid. It combines with aldehyde in aqueous solution, forming a liquid heavier than water, but does not liquefy when triturated with chloral hydrate. Its sp. gr. is 4·2; it melts at 96°, and solidifies at 95°, but remains soft and pasty below 70°. The monochloro-camphor described by Wheeler melts at 95° The rotatory power of dichlorocamphor for $[\alpha]_j = + 57{\cdot}3°$, and is constant in both alcohol and chloroform. Dichlorocamphor crystallizes well only from alcohol, in right rhombic prisms, with brachydiagonal domes, and with difficult cleavage in two directions parallel with the faces of the prism. When the crystals form rapidly, the faces of the prism are much elongated, and the crystals are long friable needles; when, on the other hand, they form very slowly, the prismatic faces are but little developed, and the crystals have an octohedral appearance.—*Jour. Chem. Soc.*, July, Aug., 1882, from *Compt. rend.*, vol. 94.

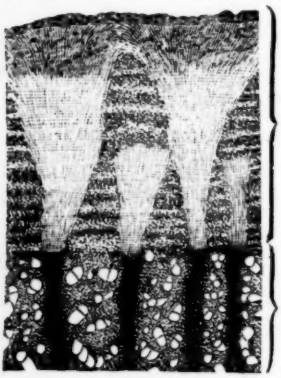
GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

Mahonia aquifolia, De Cand., s. Berberis aquifolia, *Pursh.*—For description and use of this and allied plants and analysis of Berberis nervosa, consult this journal, 1878, pages 373, 374, 414 and 589. Dr. J. Moeller has submitted the root (stem?) to microscopical examination with the following results:

The wood shows scarcely an indication of annual layers. The ducts are variable in size, rarely exceeding 0·1 mm., scattered, frequently several united tangentially, the terminal wall perforated, the lateral wall densely dotted and occasionally spirally striate; the wood parenchyma is scanty.

The young bark has no sclerotic cells; in older bark the parenchyma becomes thick-walled, forming layers resembling concentrically arranged bast layers; but bast fibres are entirely absent, and the parenchyma is short, rarely forming more than three layers. The primary medullary rays are composed of 10 or 15 rows of cells and widen gradually to a layer of 1 mm., or more. Later on secondary medullary rays are formed singly in each bark ray and attain, centripetally, considerable width. The inner cell-groups of the medullary rays become sclerotic without changing size or shape. The middle bark consists of thin-walled, tangentially elongated parenchyma and is covered by delicately flat-celled cork.



Mahonia aquifolia, transverse section; *r* bark, *h* wood.

The parenchyma contains a golden yellow substance, soluble in water, while the sclerotic cells of the wood and bark retain the color. Berberine nitrate could not be obtained by Bödeker's microchemical reaction; only traces of calcium oxalate are present and crystals are rarely observed; but sulphuric acid causes the separation of a few needles of calcium sulphate. Starch is absent, indicating that the root is collected in summer.—*Phar. Centralhalle*, 1882, p. 356 and 357.

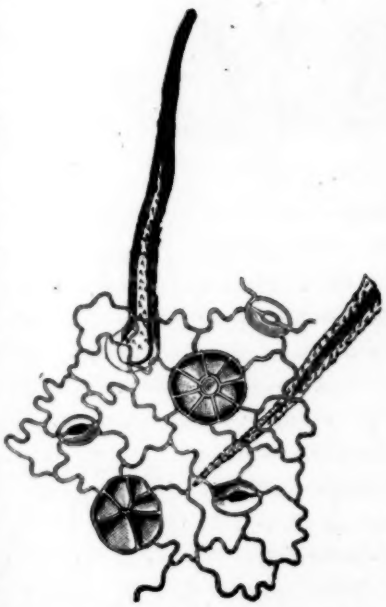
Veronica salicifolia and *V. parviflora* are known in New Zealand as "koromiko" and employed as a remedy for diarrhœa. The drug has been used by Dr. J. Jardine, of Kiukiang in China, who reports that cases of dysentery, which had varied in duration from six weeks to four

years, were cured by four or five doses of the drug.—*Phar. Jour. and Trans.*, July 29, p. 85.

Jacaranda procera, Sprengel.—The dry leaves, examined by Dr. J.

Different forms of the leaflets of Caroba, natural size.

Moeller, are of various shades of light green and brown, and variable in size and shape; but there are intermediate forms, agreeing in all other characters, which renders it probable that the drug is derived from one species only. They are assymetric, particularly near the base, are somewhat leathery, slightly revolute, the upper surface glossy, apparently smooth, the lower surface on the veins and near the margin velvety hairy; the petioles are occasionally short, and the secondary nerves anastomosing near the margin. The cuticle of the upper surface is thicker than upon the lower surface, the palissade layer is simple, the mesophyll rather dense. The epidermis consists of sinuate cells



Lower surface of Caroba leaf × 300.

with numerous stomata on the lower surface, and upon both surfaces with two kinds of hairs, either one-celled, conical, obtuse-pointed, rough, thick-walled and about 0·5 millimeter long, or short-stiped, flat, formed of 6 or 8 stellately arranged cells and containing an amber colored secretion.

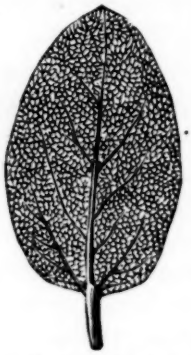
The drug is inodorous and has a bitter and astringent taste. It became first known in Germany in 1828, and about 15 years ago was recommended as blood-purifying, diuretic and antisyphilitic. Hesse (1880) found it to contain no alkaloid. For constituents, synonyms and allied plants consult this volume, page 135.—*Phar. Centralhalle*, 1822, p. 342—344.

Frankenia grandifolia, Cham. and Schl., s. Velezia latifolia, *Eschscholtz*, known as *yerba reuma*, grows near the seashore from San Francisco to San Diego and southward, and eastward in the desert of Arizona and S. Nevada. Dr. J. Moeller describes the drug as follows: Stem terete somewhat woody, little branched, about 15 centimeters (6 inches) high, leaves decussate, small, obtusely-ovate, or spatulate, the upper ones more linear, entire, one-nerved, fleshy. The young leaves and branch-tops are short-hairy, the older ones nearly smooth, sparcely hairy near the base and slightly ciliate. The branches terminate with a flower, which has frequently two lateral flowers upon short branchlets, and an involucre formed from the two last pairs of leaves. The calyx is tubular, angular, four-ribbed and four-toothed; the petals are pale reddish, clawed, small. The dry herb is gray-green, inodorous, of a saline taste, due to an incrustation of salt; after washing it is tasteless.—*Phar. Centralhalle*, 1882, No. 30.

Branch of Frankenia grandifolia (natural size).

Arctostaphylos glauca, Lind., Manzanita.—The leaves are elliptic or ovate, 25 to 40 millimeters long, 15 to 25 millimeters broad, short petiolate, mucronate, leathery, the margin slightly thickened, smooth, pale green, one-nerved, the secondary nerves not prominent and with marginal termination, both surfaces delicately and evenly netted-wrinkled, inodorous, astringent and bitter. Dr. J. Moeller describes the vascular bundles as being of an interesting structure, not roundish,

but linear on cross-section, the bast layers, however, not extending to the epidermis but ending with a stratum of collenchyma tissue, which spreads under the epidermis and often extends to the collenchyma of



Manzanita leaf (natural size).

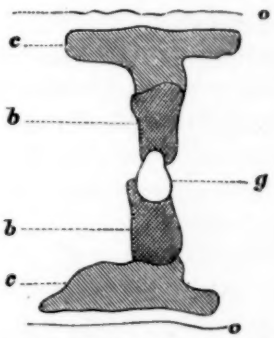


Diagram of transverse section of fibro-vascular bundle; *o* epidermis, *g* centre of bundle, *b* bast bundle, *c* collenchyme.

the adjoining vascular bundle. The parenchyma contains iron-bluing tannin. J. H. Flint obtained arbutin from the leaves (see "Amer. Jour. Phar.," 1873, p. 198).—*Phar. Centralhalle*, 1882, p. 355.

Analysis of several Plants from Uruguay.—Sacc has analyzed I, the leaves of Ficus elastica; II, the leaves of Laurus Camphora; III, a blue-flowering species of Vicia, and IV, Alsine media, the entire plant, with the following results:

	I.	II.	III.	IV.		I.	II.	III.	IV.
Caoutchouc,	·30	.....	.....	.....	Wax,	·43	.....	.....	.....
Gum,	.....	·10	·80	.....	Starch,	5·37	14·34	8·40	·79
Sugar,	1·10	5·50	17·00	.....	Woodfibre,	17·00	21·60	23·60	2·05
Tannin,	1·00	.....	.....	.....	Albumin,	.....	.....	.....	·21
Fat and Camphor,	.....	2·20	.....	.....	Dextrin,	.....	.....	.....	1·91
Fat,	.....	.....	·40	.....	Ash,	·27	3·00	6·20	2·00
Fibrin,	1·80	9·80	9·00	2·57	Water,	72·73	43·46	34·60	90·47
						100·00	100·00	100·00	100·00

—*Chem. Centralbl.*, 1882, No. 34; *Compt. rend.*, vol. 94.

PRACTICAL NOTES FROM VARIOUS SOURCES.

BY THE EDITOR.

Sulphophenate of Quinine.—Zinno states that he analyzed this salt in 1870 and that it was first prepared by Prota Giurleo; it contains 52 per cent. of quinine, 20 per cent. of sulphophenic acid and 28 per cent.

of water of crystallization. The salt is made by directly combining the alkaloid with sulphophenic acid, or by decomposing a solution of sulphophenate of lead (or of barium) by means of quinine sulphate. Since the salt is difficult to crystallize it is best dispensed in solution which should be accurately titrated.—*Annali di Chimica*, lxxiv, 282.

Preparation of Essence of Rennet from Fresh Stomachs. By Dr. J. Nessler.—In this paper the author communicates the results of some experiments made with the object of comparing the activity of essence of rennet made according to Soxhlet's method from dried stomachs ("Pharmaceutical Journal" [3], ix, 307) and that of essence made from fresh stomachs.

The experiment showed that, using corresponding quantities of dried and fresh stomach, the latter yielded the more active preparation. It was found, moreover, that the activity of the preparation from a fresh stomach could be increased by the removal of mucus, which not only made it more bulky, but prevented it from diffusing the milk so readily, and that this removal could be effected without injury by means of blotting paper. Preparations made from the top layer of the inside of the stomach, scraped off with a knife, proved much more active than others for which the residuum was used, but the residuum contained too much ferment to permit it to be left unused.

The author gives the following instructions for the preparation of an essence of rennet from fresh stomachs. Chop up a fresh calf's stomach as finely as possible, pour upon it two liters of water in which 100 grams of common salt has been dissolved, and shake well. After twelve hours add 200 cc. of 90° alcohol, and allow the whole to stand, with frequent stirring, in a closed flask for three weeks, then decant, and add sufficient blotting paper to cover it. After several weeks, during which the vessel must be kept well closed, the essence of rennet is drawn off into bottles and preserved. A liquor prepared in this way was, when fresh, capable of curdling 6,000 times its volume of milk, and, being kept in a well-corked bottle, it was found, after two years, to have diminished in activity only from 1 in 6,000 to 1 in 5,451.

The author adds that distilled or rain water gives a more active essence than spring water, and that it is advantageous to mince the stomach as finely as possible.—*Pharm. Journ. and Trans.*, Aug. 19, 1882; from *Pharmaceutische Zeitung.*

Estimation of Glycerin.—Glycerin mixed with volatile solvents is

often determined by heating at 100° to 110° until the residue ceases to lose more than 1 mgrm. per hour, while others mention that on heating for 8 to 10 hours at 100° to 110°, it is completely volatilized. (See "Amer. Jour. Phar.," 1877, p. 371; 1878, pp. 278, 377.

Couttolenc finds that glycerin is obtained in the anhydrous state when heated for five hours at 90°, but at this temperature a surface of one square centimeter is said to lose 3·17 mgrms. glycerin. According to Barbsche two drops of phenol in 8,000 to 10,000 parts of water gives a distinct blue coloration with one drop of a solution of ferric chloride, which is destroyed by the addition of 6 to 8 drops of glycerin. This reaction is recommended for detecting glycerin in wine and beer.

It is shown that the same reaction is obtained with sugar, gum arabic, etc., hence its application for detecting glycerin in wine and beer is not practicable.—*Jour. Chem. Soc.*, August, 1882; from *Dingl. polyt. J.*

Contributions to the Chemistry of Bile. By G. Hüfner.—The remarkable behavior of the galls of Tübingen cattle with ether and hydrochloric acid has already been noticed by the author. It was thought that a study of the relative quantities of glycocholic and taurocholic acids in different samples of bile would explain why some crystallized at once on addition of ether and hydrochloric acid, and other kinds refused to do so. To this end, ten samples of bile were analyzed, six of which gave a rapid crystallization of glycocholic acid, one a weak one, and three none at all; it was found that the quantities of taurocholic and glycocholic acids respectively were as one to five in the samples from which the latter acid crystallized rapidly, and about equal in those where no crystallization at all occured. That this result had nothing to do with the question as to the absolute increase or decrease in quantity of each acid in the bile was shown by the fact that dilution in the one case did not put a stop to crystallization, whilst in the other concentration did not induce it.

Again, experiments with mixtures of the pure salts of taurocholic and glycocholic acids showed that the relative proportion of the two acids present in solution together had very little, if any effect on the crystallization of the latter. Hence those biles in which there is no appearance of crystallization of glycocholic acid on addition of ether and hydrochloric acid, must contain some other body, the presence of which is possibly dependent on the nature of the animal's diet, and which prevents the crystallization of glycocholic acid under those conditions.—*Jour. Chem. Soc.*, August, 1882; from *J. pr. Chem.*

VARIETIES.

COLLODIUM FOR CORNS.—1. *Gezow's:* Salicylic acid, 3·0; collodium, 24·0; extract of cannabis indica, 0·5 gm. Dissolve.

2. *Wit-Tshaikowski's:* Salicylic acid, 5·0; collodium, 30·0; turpentine, 3·0 gm.—*Hager's Praxis, Supplement.*

APOMORPHIA AS AN EXPECTORANT.—We read in "le Journal Thérapeutique" that Dr. Beck used apomorphia as an expectorant in sixty-three cases of bronchial catarrh, and in thirty-one of broncho-pneumonia. The bronchial secretion becomes more fluid and the thick secretion common particularly in broncho-pneumonia is ejected with more facility. The prescription for an adult is as follows:

℞	Apomorph. chlorhydrat., ...	gr. ¾
	Ac. chlorhydric. dil., ...	♏xv
	Syr. simplicis, ...	℥i
	Aquæ, ...	℥iv. M.

The dose is a tablespoonful every two, three or four hours. A teaspoonful would be the proper dose for children of from three to ten years of age.—*Med. and Surg. Rep.*, August 12.

CHLORALATED TINCTURE OF IODINE.—Carlo Pavesi gives the following formula: Iodine, 20; chloral hydrate, 30; alcohol of 36°, (sp. gr. ·958?) 140 parts. The solution takes place without decomposition and the preparation is miscible with water without precipitating. It is of a pure golden hue, has the odor and taste of its ingredients, coagulates albumen readily and is an excellent hemostatic and very useful in the treatment of large wounds as an antiseptic and hypnotic.—Io. Spallanzani.—*Medical Record.*

BENZOL INHALATIONS IN WHOOPING COUGH.—An anonymous writer sends a short communication to the "London Lancet" on this subject. As a substitute for the inhalation on gases, which are thrown off in the neighborhood of gas works, he caused his patients to inhale the vapor of benzol, which he diffused through the air of the room by means of a spray apparatus, such as is used by Lister "with the most gratifying results. It certainly checked the spasm and relieved the whoop."—*The Cincinnati Lancet and Clinic.*

THIRTIETH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

FIRST SESSION—TUESDAY, SEPTEMBER 12TH.

The sessions of the Association were held in the Cataract House, at Niagara Falls, one of the spacious halls having been fitted up for the occasion. The acoustic properties of the meeting room were better than at several previous meetings, but were by no means as perfect as might have been desired for such a large assemblage. Over 200 members were in attendance, but the exact number is as yet unknown, many of the members hav-

ing been prevented from registering in consequence of not finding the register upon the table assigned for it.

Shortly after the appointed hour President Bedford called the meeting to order, and appointed Messrs. E. Lilly of Indianapolis, P. C. Candidus of Mobile and A. W. Miller of Philadelphia a committee to examine credentials. The Local Secretary, Mr. H. E. Griffith, was introduced to the meeting, and, referring to the numerous beauties and magnificent sceneries of this attractive spot, extended a hearty welcome to the visitors.

The President delivered his annual address, in which he referred to the history of this Association, to the rapid increase of local and State pharmaceutical associations, to the enactment of pharmacy laws, to the forthcoming new Pharmacopœia, and to various other matters of interest and importance to pharmacy in general and to the Association in particular. The address was well received, and, on motion of Dr. Menninger, received the thanks of the Association, and was referred to a committee consisting of ex-Presidents Gordon, Markoe and Bullock for consideration and report upon the suggestions.

The Council reported the names of 77 applicants for membership, after which the various committee reports were read by title. The Committee on Credentials reported that delegates had been accredited from the Colleges of Pharmacy of Chicago, Cincinnati, Louisville, Maryland, Massachusetts, National (Washington), New York, Ontario, Philadelphia, Pittsburgh and St. Louis; from the State Pharmaceutical Associations of Alabama, Connecticut, Georgia, Indiana, Iowa, Kansas, Kentucky, Massachusetts, Missouri, New Hampshire, New Jersey, New York, North Carolina, Nova Scotia, Ohio, Pennsylvania, Rhode Island, South Carolina, Virginia, West Virginia and Wisconsin; from the Local Associations of Albany County, N. Y., Cleveland, O., Erie County, N. Y., German Apothecaries of New York, Indianapolis, Kings County, N. Y., Lancaster County, Pa., Mobile County, Ala., Monroe County, N. Y., Newark, N. J., Richmond, Va., and Toledo, O.; and from the Alumni Associations of the Chicago, Louisville, Massachusetts, New York, Philadelphia and St. Louis Colleges of Pharmacy. The credentials of the delegates of the Western Wholesale Drug Association were referred back to the meeting, the committee not being able to satisfy themselves that the Association was entitled to delegates under the by-laws.

A motion made for the recognition as delegates of two members of the Kings County Pharmaceutical Society, the entire delegation being absent, was, after some opposition, withdrawn. The committee of the Western Wholesale Drug Association were then invited to take seats and participate in the discussion on pharmaceutical subjects that may come before the meeting; and the representatives of the pharmaceutical bodies named above were received as delegates. Mr. Richardson, of St. Louis, as the chairman of the committee named before, addressed the meeting, stating that the association he represented had virtually become a national association, and that, though working in different paths, the field of labor of the wholesale drug and pharmaceutical associations was very similar; he offered congratulations and sympathy in the persistent labors and high aims, and hoped

that a similar committee from the pharmaceutical association would meet, in a spirit of fraternal good will, the Wholesale Drug Association at its meeting in Cleveland in November next.

The Committee on Legislation presented a lengthy report, with copies of laws affecting pharmacy and pharmacists. During the past year pharmacy laws were enacted in Georgia and Wisconsin; amendments to the pharmacy laws in Connecticut, Iowa and West Virginia; laws against the adulteration of food and drugs in Louisiana and Massachusetts, and laws affecting pharmacists in the use of liquor for medicinal purposes in Connecticut and Iowa. Through correspondents there were also obtained older laws on pharmaceutical matters, which had not been previously published by the Association, from the States of Alabama, Colorado, Indiana, Kentucky, Minnesota, Tennessee and Texas.

The Nominating Committee was appointed in the usual manner, each delegation naming one member, and in addition thereto the President appointed Messrs. J. A. Lee, of New Iberia, La.; J. F. Llewellyn, of Mexico, Mo.; T. W. Shryer, of Cumberland, Md.; W. S. Robinson, of Yorkville, Ont., and C. M. Driggs, of White Haven, Pa.

A Committee on Exhibits was appointed by the President, consisting of Messrs. Wm. B. Thompson, of Philadelphia; Theo. Schumann, of Atlanta; J. W. Caldwell, of Detroit; T. J. Casper, of Springfield, O., and George Eger, of Cincinnati; after which the Association adjourned until Wednesday morning.

Second Session—Wednesday, September, 13th.

After the reading and approval of the minutes of the first session, the Nominating Committee presented a report, recommending the election of the following officers and Standing Committees for the ensuing year:

President, Charles A. Heinitsh, of Lancaster, Pa. Vice-Presidents—Jno. Ingalls, of Macon, Ga.; Louis Dohme, of Baltimore, Md.; Wm. B. Blanding, of Providence, R. I. Treasurer, Charles A. Tufts, of Dover, N. H. Permanent Secretary, John M. Maisch, of Philadelphia, Pa. Reporter on Progress of Pharmacy, C. Lewis Diehl, of Louisville, Ky. Members of the Council—S. A. D. Sheppard, of Boston, Mass.; Wm. Saunders, of London, Ont.; Wm. S. Thompson, of Washington, D. C.; Committee on Drug Market—Geo. W. Sloan, of Indianapolis, Ind.; Jas. G. Steele, of San Francisco, Cal.; W. H. Wickham, of New York; I. L. Lyons, of New Orleans, J. P. Muth, of Baltimore, Md. Committee on Prize Essays—C. Lewis Diehl, of Louisville, Ky.; John F. Judge, of Cincinnati, O.; Emil Scheffer, of Louisville, Ky. Committee on Legislation—John M. Maisch, of Philadelphia, Pa.; Samuel A. D. Sheppard, of Boston, Mass.; Chas. Mohr, of Mobile, Ala. Committee on Papers and Queries—J. U. Lloyd, of Cincinnati, O.; A. Mayell, of Cleveland, O.; W. W. Bartlett, of Boston, Mass.

All the nominees were duly elected, and the new President and two of the Vice-Presidents were introduced to the meeting, and on assuming the duties of their offices made brief addresses returning thanks; the second Vice-President elect was not present at the meeting.

The delegation of the Illinois Pharmaceutical Association presented credentials and was admitted. Invitations for holding the next Annual Meeting were received from San Francisco, New Orleans, Atlantic City, Cincinnati, and Washington, and a committee of five was appointed to report thereon.

The Secretary of the Council read the minutes of the six sessions held by that body since last year. These minutes inform of the election of Dr. Charles Rice as the second member for the United States of the International Pharmacopœia Commission; a plan for using the income from the Centennial Fund had been adopted; the traveling arrangements to and from the annual meeting had been referred to the Entertainment Committee; a plan for the general management of the financial affairs of the Association by the Treasurer, under the supervision of the Finance Committee, had been perfected; the accounts of the Treasurer had been audited, showing a cash balance in his hands amounting to $1,981.10; the Ebert fund, the Centennial fund and the life-membership fund are separately invested in U. S. 4 per cent. registered government bonds. The Committee on Membership reported the roll to contain 20 honorary and 1,286 active members; ten of the latter had died since last year.

The various committee reports were read and referred, and the reading of papers was then proceeded with.

On thymol from oil of thyme was the subject of a paper read by Mr. Jos. L. Lemberger, who purchased nine separate lots of the oil, one of which was known to have been distilled from Thymus vulgaris in this country. By treatment with soda four of the oils yielded less than 1 per cent., the remaining samples, all of which had a red color, 1·67, 6·67, 7·92, 16·67 and 38·75 per cent. of crude thymol; from the American oil, which was white, ·84 per cent. was obtained.

Considerable discussion took place on this subject, in which the properties of commercial thymol, its antiseptic value, its chemical nature as an alcohol and phenol, its yield and its occurrence in other volatile oils was alluded to. In regard to the latter, Prof. Maisch stated that thymol could be obtained in considerable quantity from the volatile oil of an American plant, Monarda punctata, from which it frequently crystallized on standing. The yield of volatile oils and the relative proportion of their proximate constituents were not constant, but were subject to the nature of the soil, the climate and atmospheric influences generally; the volatile oils distilled from thyme raised in different localities must therefore be expected to vary in the amount of thymol. Since the oil consisted also in part of hydrocarbons, which have a lower boiling point, it was natural to expect oil of thyme distilled from the fresh herb to contain relatively less thymol than such which had been obtained from the dry herb, which would yield a smaller percentage of volatile oil, containing, however, most likely, a larger percentage of thymol.

Mr. G. W. Kennedy read a paper on *Commercial Mercurial Ointment*, giving the assays of 15 samples. The mercury was determined by removing the fat by means of ether, also by Thein's method ("Amer. Jour. Phar.," 1882, p. 309); 12 samples from retail stores yielded from 21·5 to 40,

and only one 50 per cent. of mercury, while 3 samples obtained at wholesale gave 41·75, 46 and 48 per cent.

In the discussion attention was drawn to the facts that, as prepared on a large scale, when mercurial ointment is filled while warm, as is often the case, a certain amount of variation must be expected in the contents of the first and last jars; that ointment kept in a warm place will contain different amounts of mercury in the upper and lower layers, and that it is customary in many places to dispense the officinal ointment only upon prescriptions, while for the ordinary retail trade a weaker ointment is sold. That in cases of sharp competition, this article is occasionally adulterated had been observed by Dr. Menninger, who had met with an ointment containing only a very small amount of mercury, the deficiency in color being concealed by the admixture of powdered charcoal. It was also stated that at wholesale two kinds of mercurial ointment are kept, one containing $\frac{1}{2}$, the other $\frac{1}{3}$ mercury, the difference being, as a rule, indicated upon the label.

A paper by Prof. Emlen Painter on *the preparation of mecurial ointment* was read, giving a process by which one person can easily prepare from 40 to 50 lbs. a day. Four pounds of mercury and four ounces of mustard-seed oil, or other limpid fixed oil, are stirred together with a spatula in a flat iron dish, until uniformly divided into small globules, for which five minutes or less is required; next, four ounces of tallow, or of a mixture of tallow and lard, is added, cold, and rubbed together until uniformly mixed. The granular mixture is then transferred to a marble slab, two feet square, and rubbed with a spatula loosely at first, afterwards with more pressure, a little tincture of benzoin being added, until the globules of mercury are no longer visible, when it is returned to the iron dish, stirred together with eight ounces of oil and then with a mixture of equal parts of tallow and lard, melted together and cooled to about 170°F., when merely continuous stirring will be required until the whole stiffens. The ointment is now again transferred to the slab and rubbed in divided portions to insure uniform mixture.

In the remarks following the reading of this paper it was stated that Professor Remington's process ("Amer. Jour. Phar.," 1881, p. 192) which had been adopted in the new pharmacopœia, appeared to be more expeditious and less troublesome.

Mr. P. C. Candidus read a paper on *the solubility of chemicals in alcohol*, both at 155°C. (60°F.) and at the boiling point. The correctness of the results more particularly of those obtained at the elevated temperature, was questioned, because during the heating which was conducted in a test tube loosely stoppered, strong alcohol was most likely evaporated, leaving a more aqueous liquid behind; the results with alum (1 in 5), burnt alum (1 in 6), potassium chlorate (1 in 8·5) and others seem to prove the corectness of the objection.

After paying a visit to the exhibition room the Association adjourned until Thursday morning.

Third Session—Thursday, September 14th.

The minutes of the second session having been read and approved, those

of the Council were read and likewise endorsed, the latter giving information of the election of 111 new members, and of the recommendation of the following gentlemen for honorary membership: Thos. Greenish of London, Peter Squire of London, Jos. Ince of London, Geo. F. Schacht of Clifton, Bristol, and Rich. Reynolds of Leeds, England; Christian Brunnengraeber of Rostock and Carl Schacht of Berlin, Germany; F. von Martensen of St. Petersburg, Russia; Nicholas Sinimberghi of Rome, Italy; Michael Carteighe and G. W. Sandford of London.

Credentials from the Pharmaceutical Association of Quebec were received and the delegates admitted.

The committee on the time and place of the next annual meeting recommended that it be held in Washington, D. C., on the first Tuesday of September, 1883; they likewise recommended that hereafter the Entertainment Committee name two or more places for holding the next meeting, and that the Secretary be instructed to acknowledge the invitations received from Atlantic City, San Francisco and New Orleans. The recommendations were adopted, but the time was afterwards changed to the second Tuesday of September.

Amendments to the by-laws previously proposed were acted upon and adopted; these require the Council to examine the credentials of delegates previous to the first session, the credentials to be sent to the Permanent Secretary at least two weeks in advance of the annual meeting, and the publication, in the Proceedings, of a synopsis of the Council sessions.

Mr. Sheppard spoke warmly in favor of holding a meeting in San Francisco during the next three years. Several members who participated in the discussion acknowledged the desirability of meeting on the Pacific coast, but regarded the length of time the attending members from the East would necessarily have to be absent from home, and the expense of the journey as serious obstacles. However, a committee consisting of Messrs. S. A. D. Sheppard of Boston, T. Roberts Baker of Richmond, Va., and J. S. Evans of West Chester, Pa., was appointed, to consider this matter in all its relations and report at the next annual meeting.

The motion to appoint a committee of five to attend the next meeting of the Western Wholesale Druggists' Association at Cleveland, and express the sympathy and interest of the Pharmaceutical Association in their organization, created some discussion, resulting in the adoption of the resolution and the appointment of Messrs. W. J. M. Gordon of Cincinnati, Chas. Bullock of Philadelphia, Wm. Saunders af London, E. H. Sargent of Chicago, and E. Shallentrager of Cleveland.

On Caffeine in Guarana.—Mr. J. H. Feemster read a paper on this subject. The author first examined a select example of seeds which proved to contain 5·08 per cent. of caffeine. Five samples of guarana yielded 3·9, 4·2, 4·2, 4·3 and 5·0 per cent., or an average of 4·32 per cent. of the alkaloid. The process employed was that of Prof. Wayne, described in the "Amer. Jour. Phar.," 1875, p. 135, and 1877, p. 337, the guarana being mixed with an excess of litharge and boiled with water until the insoluble matter settles rapidly, which requires about three hours, while the same change takes place with the seeds in less than one hour. The cause of this difference in behavior has not been ascertained; it was, however, observed that

the addition of a few drops of subacetate of lead at the time when the color of the solution begins to disappear apparently facilitates the disposition of the insoluble matter, leaving the liquid more free from coloring matter and causing the caffeine to separate in crystals so white that recrystallization is unnecessary.

For the purpose of determining the most suitable menstruum for preparing a *fluid extract of guarana* the drug was exhausted with mixtures containing in the pint four fluidounces of glycerin and from 3 to 8 fluidounces of alcohol. The guarana exhausted by percolation—2¾ pints of percolate being obtained from 16 troyounces of the drug—still contained about one per cent. of caffeine, and the fluid extracts obtained after several months commenced to deposit chocolate-colored precipitates, enclosing groups of crystals of caffeine; these precipitates, however, decreased with the increased alcoholic strength and did not form in the fluid extract made with a menstruum of one-half alcohol and one-fourth glycerin, while diluted alcohol without glycerin did not prevent the deposition.

Mr. Cowdrey read a paper *on commercial extracts of malt* and demonstrated the rapid liquefaction of warm starch paste by means of Trommer's extract of malt, proving that it contains a considerable amount of diastase. Professors Diehl and Maisch objected to the reception of this paper under the belief that the name of the preparation was copyrighted and the process a secret one; but assurance was given that such was not the case, and the author was requested to embody in his paper the process by which the preparation is made and which is based upon the well-known fact that diastase, while destroyed at a boiling temperature, is not altered by a heat of 75°C. (167°F.). When malt is boiled with water or the infusion of malt is evaporated at or near the boiling point, the resulting extract contains no diastase.

Prof. Prescott directed attention to the importance of testing extract of malt for its power of converting starch into dextrin, and alluded to some of of the precautions necessary in the application of this test.

In connection with the questions raised by this discussion Mr. Cowdrey inquired in regard to the position of the American Pharmaceutical Association towards *copyrighted preparations* and *secret processes.* Dr. Menninger thought that as yet the Association had not expressed itself on these points; but Prof. Maisch showed from the records that the Association from its very organization had taken a decided stand against such practices. In 1852, when copyrighted pharmaceutical and chemical preparations were unknown, the Association in its Code of Ethics, Art. I, discountenanced quackery and dishonorable competition in business, and in Art. VII declared it to be the duty of every apothecary and druggist to publish the new ideas and phenomena that may occur in the course of his business. In 1853 a resolution was passed urging the discouraging, by every honorable means, of the use of nostrums, and the abstaining from manufacturing any medicine the composition of which is not made public. In 1854 the report of a committee on quack medicines was approved, reaffirming these sentiments. In 1856 the Constitution was altered and Sections 1 to 5, of Art. I, adopted substantially as they are at present, the 5th section declaring one of the

objects of the Association to be the suppression of empiricism. In 1870 Sections 6 and 7 were added, the latter declaring in favor of creating and maintaining a standard of professional honesty equal to the amount of our professional knowledge. The Code of Ethics not having been published for a number of years, the Association, in 1868, had the matter investigated by a committee and then declared that it had been superseded by and embodied in Article I of the Constitution. Since 1857 exhibitions have been had at the time of the annual meetings, and though the by-laws were silent on this subject, it was well understood that secret and patented medicines should not be exhibited, and if perchance they should have eluded the vigilance, that they should not be reported on. Notwithstanding this, objectionable articles had crept in, so that in 1877 a motion for abolishing the exhibitions was made and referred to a committee, which reported a set of rules that were adopted, and have also become the guide for a number of the State Pharmaceutical Associations. These rules absolutely exclude from the exhibitions all proprietary and patented medicines, medicinal or pharmaceutical preparations the names of which have been copyrighted or the complete working formula of which is withheld and such chemical preparations or mixtures which are offered under other than their proper scientifically recognized names. Many preparations, which are prescribed by physicians and recommended by professors in medical colleges in different parts of the United States, cannot be admitted to these exhibitions, and while it is not required that the preparations on exhibition shall have a label giving the working processes, still every member has the right to ask for the same, and if refused, such preparations would be excluded.

On account of the position taken by the Association in this question no action was deemed necessary upon a communication from the Pennsylvania Pharmaceutical Association, protesting against the injustice of allowing the copyrighting of common pharmaceutical names; it was ordered to be spread upon the minutes.

A resolution declaring in favor of quinine free of duty was promptly tabled.

Professor William B. Carpenter of London, England, was introduced to the Association and cordially received. In thanking the Association for this reception, he offered his congratulations on the progress of pharmacy on this continent and referred to the advance made in science generally and more especially in microscopy.

The report of the Committee on the President's Address was read. The recommendation for placing the sum of $200 at the disposal of the Council for defraying such expenses as may be incident to their duties was carried. The Entertainment Committee was retained as a special committee and three additional members added to it. In regard to the proposed change of time for the installation of the officers the majority report, recommending that no change be made, was adopted by a vote of 41 ayes against 10 nays.

On motion of Mr. Sheppard the sum of $100 was voted to the Secretary of the Council for services rendered during the past year.

Mr. Rosenwasser commenced the reading of a paper entitled *a study of*

percolation, which, owing to its extreme length, was referred for publication. The author reviewed the theory of percolation, discussed the various methods proposed for percolating under pressure and pointed out what he considers the advantages of the apparatus constructed by him, in which the vegetable powder is confined in a limited space so as to permit of no expansion (see "Amer. Jour. Phar.," 1881, p. 569).

A paper on *gentiopicrin* by Prof. E. L. Patch was read, detailing his experiments for obtaining this principle in the crystalline state from the dry root, in which he was unsuccessful, thus corroborating Kromayer's observations.

Prof. Bedford read a paper on *commercial creasote* and the different reactions of phenol and wood creasote. In the discussion attention was directed to the fact that creasote is a mixture of different compounds and that its composition and behavior must necessarily vary to some extent if obtained from different kinds of wood.

Professor Bedford also read a paper *on commercial bismuth and bismuth salts.* The subnitrate and subcarbonate of bismuth obtained from six manufacturers merely contained traces of alkaline earths, two samples also traces of ammonia, while all contained arsenic, the amount varying from ·04 to ·3 per cent. A specimen of Australian bismuth contained traces of copper and arsenic.

An interesting paper giving the results of numerous experiments *on the germination of seeds of medicinal plants* was read by Mr. Wm. Saunders. The many failures with seeds which did not germinate were attributed to the fact of the seeds being old and dry.

Fluid extract of Hydrastis canadensis was the title of a paper by Mr. Chas. Spenzer of Cleveland, O., which gave the methods employed for assaying nine samples of the commercial fluid extract. The results are tabulated thus:

Specific gravity of Fluid Extract	Diluted distillate	Physical appearance of fluid extract.	Solid Extract	Alcohol per ct.	Glucose and Cane sugar.
1·056	·940	Clear dark brown.	231 gr.	39	none.
·9715	·935	Clear red-brown.	125½ "	42	small amount.
1·1645	1·010	Clear brown-yellow.	185½ "	none.	large amount.
·9725	·960	Clear brown-yellow.	100 "	29	none.
1·047	·940	Dark brown; fine sediment.	211½ "	39	"
·9545	·935	Dark brown; granular sediment.	154½ "	42	small amount.
·996	·945	Clear dark-brown.	210½ "	37	large amount.
1·0485	·940	Clear red-brown.	215 "	39	none.
·973	·930	Red-brown; granular sediment.	218 "	44	none.

An adjournment was had until Friday morning.

Fourth Session—Friday Morning, September 15th.

The minutes of the previous session and of the Council having been read and approved, a motion that the Entertainment Committee be requested hereafter to provide no banquet, was carried, but reconsidered at the request of the chairman of that committee, and after some allusion to the uncivil treatment at the Cataract House withdrawn.

A paper by Prof. W. T. Wenzell of San Francisco *on phosphoric acid* was read, in which the author advocates the revival of the old process of the slow oxidation of the phosphorus by moist air. An ordinary infusion jar was found convenient for this purpose, the stick phosphorus being placed

upon the diaphragm, sufficient water poured in to partially immerse the sticks, and the top covered with a porous disk of plaster of Paris. Larger quantities of phosphorus may be oxidized by using a tray, one three inches in depth with a surface of 9 by 5 inches admitting of the oxidation of 8 ozs of phosphorus, which is placed upon a grating resting upon a narrow shelf at the height of about 1½ inch from the bottom; the tray is covered with a porous tile and the acid liquid drained off and at the end of the process withdrawn through a movable bent tube inserted near the bottom of the tray and adjusted so as to reach to the height of the grating. The apparatus should be made of well-glazed pottery, possibly gutta percha may answer; but if made of lead, a portion of that metal will be dissolved. The products of this moist aerial oxidation are ozone, hydrogen peroxide, ammonium nitrate, phosphorous and phosphoric acids, of which, with proper management, the latter is produced in by far the largest quantity. On concentrating the liquid, arsenic, if present, will separate completely in the metallic state when the temperature reaches 160°C. (320°F.), the reduction being effected by the phosphorous acid, which at a higher temperature would be decomposed into phosphoric acid and spontaneously inflammable hydrogen phosphide. After the deposition of the arsenic the liquid is diluted, filtered and oxidized by nitric acid, of which, for 360 grains of phosphorus, only from two to five drachms are necessary, against five troy-ounces required by the officinal process. By thus oxidizing about nine-tenths of the liquid any excess of nitric acid may be removed on the addition of the reserved portion, and the quantity may be still lessened by conducting this operation in a large flask, holding from 8 to 10 times the volume of the acid liquid, when but a very small quantity of nitrous fumes will escape and the nitric peroxide will be utilized in the oxidation.

In the discussion on this paper it was stated that the product of oxidation of phosphorus in moist air was formerly known as *phosphatic acid*, and contained phosphorous and phosphoric acids in variable proportions, the former being almost exclusively present in the beginning and as long as unoxidized phosphorus was found in the apparatus in some quantity. Professor Markoe spoke of certain precautions in the process for oxidizing phosphorus, without heat, by nitric acid in the presence of iodine and bromine, and Prof. Lloyd referred to modifications of the officinal process with hot nitric acid.

Mr. C. B. Allaire read an interesting paper *on the purity of powdered drugs*, giving merely the results of investigations. Of 416 samples of powdered drugs, sold in bulk, 189 or about 46 per cent. were sufficiently adulterated that detection was easy. Golden seal was found mixed with starchy matter, fringe tree bark and wahoo bark with the wood of the root, liquorice with corn starch and sugar, ipecac with starch and with American ipecac (Euphorbia Ipecacuanha?) etc. The writer stated, very properly, that the remedy was not solely in legislation, nor in education combined with indifference, but in education combined with vigilance, and it should have been added, with personal integrity. It was stated that there are parties engaged in preparing adulterants costing from 2 to 4 cents per pound,

and that they agree to match in color and appearance any powder that may be submitted.

Mr. Richardson, of St. Louis, stated that adulterations were due to the demand for low priced goods by the consumer and retailer, and to the tendency in the wholesale trade to sell goods at a figure representing the profits as nearly as may be by naught.

Prof. Maisch had no doubt of the prevalence of adulteration, but, looking at the condition of the drug market at the present time, and comparing it with that of 20 or 30 years ago, there was undoubtedly a vast improvement, and this matter was perhaps better, certainly not worse, than in most civilized countries. Formerly adulterated goods were openly manufactured in Europe, and inferior drugs sent here, as being good enough for America, while now the best articles were very generally selected, and considered none too good for this market. He also spoke of the difficulties connected with proximate analysis, and with the assaying of many drugs, and that the results, while they might be perfectly satisfactory to the investigator who may undertake the labor in good faith, yet would be unreliable or insufficient if measured by the standard of an expert.

Boracic acid, its preparation and uses, was the subject of a paper by Mr. Edmund Dana, Jr., of Portland, Me. The author found its preservative action mentioned only in the Proceedings for 1880, p. 229, but overlooked the notice in Proceedings, 1873, p. 269, and in "Am. Jour. Phar.," 1872, p. 353. The paper gives a condensed account of its chemical, physical and therapeutical properties, and gives formulas for a concentrated *liquor*, (boric acid grs. xviii, water f℥i), *glycerite* (boric acid ʒiii, glycerin f℥i, to be dissolved with the aid of a water-bath) and an *ointment*, the latter to be made by melting together white wax ℥ii and vaseline ℥xii and adding glycerite of boric acid ℥ii.

During the discussion on this paper a specimen of boroglyceride, prepared by Mr. Thomas E. McElhenie, was shown, and the irritating qualities occasionally observed on the use of boric acid were referred to as being probably due to adhering sulphuric or hydrochloric acid, which contamination could be avoided by recrystallization from water.

Mr. A. Conrath presented a paper on *the alcoholic strength of commercial fluid extracts*, giving the results of the examination of a number of these preparations.

A valuable paper by Prof. Lloyd, treating of *precipitates in fluid extracts*, was read. It was a continuation of one presented the previous year, in which it was shown that in such complex solutions as percolates each stratum, as it passes from the percolator, represents a liquid holding in solution certain substances soluble therein only through the intervention of other substances directly soluble in the simple menstruum, and that by the mixture of each succeeding stratum with those that preceded it the character of the liquid continually changes, even if the simple menstruum remains the same, so that substances may now become insoluble which in the preceding liquid were held in perfect solution. To establish the final equilibrium of a complete solution requires a certain length of time, but in the present paper the author shows that in such concentrated solutions as fluid

extracts this time may never arrive, inasmuch as solubility is also influenced by temperature, and by even slight changes of temperature different strata are produced, with different solvent powers, whereby substances previously precipitated or rendered insoluble in one stratum may be dissolved by another, thus again changing the nature of the liquid and of the different strata of this liquid as a solvent; every change in temperature will be followed by either decreased or increased solvent power, and consequently by more or less precipitation or re-solution of the precipitate.

On motion of Dr. Menninger, seconded by Messrs. Maisch and Kennedy, the following resolutions were passed:

Resolved, That this Association deems it of importance to the efficiency of the natonal military and naval organization, as well as due to the national reputation, that none but well-qualified persons, either graduates in pharmacy or licentiates in pharmacy, be employed as hospital stewards or apothecaries in the public service.

Resolved, That, in the opinion of this Association, such professional men should be raised to a rank commensurate to the qualifications requisite for such a service, and that, for the purpose of obtaining efficient services, and in recognition of a learned profession, such officers should hold rank as commissioned officers.

Resolved, That the Committee on Legislation be and hereby is instructed to forward copies of these resolutions to the honorable Secretary of the Army and of the Navy, to the Surgeons-General of the Army and Navy, and to the Chairmen of the Army and Navy Committees of the United States Senate and House of Representatives.

Professor Bedford announced the death, on Sept. 13th, of Mr. Henry T. Kiersted, one of the oldest apothecaries in the United States, who entered the drug business in 1814, and who was President of this Association from 1860 to 1862.

Resolutions of thanks to the Entertainment Committee, the press, and to the past officers were passed, and the Association then adjourned to meet in Washington, D. C., on Sept. 11, 1883.

BRITISH PHARMACEUTICAL CONFERENCE.

Southampton has during the fourth week of August been the rendezvous of such pharmacists as have been able and had the inclination to avail themselves of the opportunity afforded by the annual meeting of the British Pharmaceutical Conference to vary the monotony of the ordinary routine of their lives by friendly intercourse with their *confrères*. The Conference commenced on Tuesday, Aug. 22, at half-past ten o'clock, in the Watts Memorial Hall, under the presidency of Professor Attfield, F.R.S., the visitors being welcomed, in a few well-chosen words, by Mr. Randall, speaking in the name of the local pharmacists. The audience was not so large as on some similar occasions in previous years, and did not nearly fill the area of the handsome hall in which the Conference met; whilst the general attendance appeared to be below the average, and this is confirmed by the number of signatures in the book placed at the entrance.

After a formal reception of the delegates present from various societies, the business of the meeting was commenced by the reading of the report of the Executive Committee. The report referred to the alterations that were introduced into the last "Year Book" and to the subject of grants in

aid of original scientific research. It also mentioned the resignation of one of the General Secretaries, Mr. M. Carteighe, in consequence of his accession to the Presidency of the Pharmaceutical Society of Great Britain, and stated that the consequent vacancy had been temporarily filled, at the request of the committee, by Mr. Sidney Plowman. From the financial statement it appeared that during the past year the expenditure had exceeded the income by about £65, which was partly due to a falling off in the number of members from whom subscriptions had been received. In alluding to this deficiency the President remarked that the introduction of the Parcels Post System would lessen the expense of distributing the "Year Book" in future, and he expressed an opinion that an appeal to the registered chemists and druggists who are not already members of the Conference should be followed by an increase of members sufficient to prevent a deficit in future years; further, that although the committee had felt compelled to defer for the present, for financial reasons, the compilation of the General Index which had been sugested, the postponement would only be of short duration.

The address of the President was undoubtedly the most important feature of the meeting. The Conference has been privileged in previous years to hear admirable addresses from different presidents, but in no previous year has a more marked impression been produced. As the address has been printed *in extenso*, it is not necessary to summarize it here, neither will this be the best opportunity for its criticism. As remarked by one of the speakers, it will doubtless be read with pleasure by all English speaking pharmacists, and the decided opinions expressed, couched in language that admits of little misunderstanding, will probably evoke a considerable amount of discussion. Indeed, that it has already attracted attention outside the pharmaceutical circle is evidenced by the fact that the "Times" has already devoted a leading article to the discussion of some of its topics. It will be sufficient to say here that the address was admirably delivered and was listened to with that silent attention which is sometimes better evidence of interest than the most boisterous applause.

The first papers read consisted, as usual, of reports of work undertaken at the request, and with the aid, of the Conference. The first was a "Report on the Differences between the Essential Oils of Cinnamon and Cassia," by Mr. A. H. Jackson. The reporter stated that, tested from a physical standpoint, the oils possess distinctive and characteristic odors and that the cinnamon oil has a more fiery taste than the cassia, but that neither the relative densities nor the refractive energies are sufficient guides in distinguishing mixtures of these oils, though the density of the oil of cassia was found to be somewhat greater than that of the oil of cinnamon. The chemical examination seemed to show that the constituent or constituents in which the oils differ from each other are present only in extremely small proportion. The next report was by Mr. A. W. Gerrard, "On the Alkaloidal Value of Belladonna Plants," which was a continuation of a report on the same subject presented last year. The experiments referred to in the report were made upon uncultivated plants in their first year's

growth, from a chalk soil in Yorkshire and from a leaf mould in Sussex, and also upon cultivated plants in their second year's growth, gathered in May, June and July, or before flowering, whilst in flower, and whilst in fruit. The results obtained with the wild plants indicated that belladonna in the first year of its growth contains a very small proportion of alkaloid, but to that extent they were confirmatory of previous deductions by the author that the formation of alkaloid in the plant is favored by a chalky soil. Experiments with the cultivated plant showed that the plant becomes most rich in active principles at the period of flowering and that the proportion is maintained in the fruiting season; further, that there is a simultaneous development of alkaloidal matter in the root and in the leaf, the former not being exhausted to strengthen the latter. A slight discussion followed, in the course of which Mr. Holmes remarked that he had observed that belladonna grows more luxuriantly in calcareous soils, which might perhaps account for its being richer in alkaloid. At the close of this discussion the Conference adjourned to luncheon, which was provided in an adjoining room.

On resuming, the first paper read was entitled "A New Styptic of Indigenous Growth," and contained some observations of Professor Quinlan upon the hæmostatic properties of the leaves of the *Plantago lanceolata*, or ribgrass. Notwithstanding the form of its title, the paper contained some interesting quotations from Shakspeare and Culpepper, proving that the ribgrass long ago had a great reputation as a styptic. Professor Quinlan exhibited some pharmaceutical preparations of the plant, but it would appear that for external application the dried leaves are effective or the fresh leaves in a paste such as would be produced by mastication. It is not quite clear in what manner the leaf acts, but some experiments appeared to show that it is devoid of any kind of tannin, and it was suggested by Professor Tichborne that if there were an astringent principle present it might be allied to the catechuic acid compounds. Mr. Borland said that *Plantago lanceolata* had long been used in the district in which he lived to staunch the bleeding of wounds, but he had hitherto thought that it was merely because they formed a convenient covering of a wound.

A *résumé* was then given by Mr. W. A. Shenstone of "Some Experiments on English Oil of Lavender," which had been undertaken to test statements made by foreign chemists to the effect that oil of lavender sometimes deposits in cold weather a camphor, identical with common camphor, and that the oil contains a hydrocarbon boiling at a very high temperature (200° to 210°C.). Mr. Shenstone was unable to confirm either of these statements, the oil used by him evidently not containing any notable quantity of crystalline constituents, whilst the distillate collected about the temperature mentioned contained a large amount of oxygen. It would also appear from the independent experiments of the author and M. Bruylant that the English and foreign oils of lavender differ very considerably in the amount of terpene which they contain. It may be remarked, in passing, that Mr. Shenstone's *résumé* was evidently appreciated by the audience, and it is worth consideration whether it would not be better, as a rule, to summarize papers containing a large number of details that cannot

be followed in the reading and to present the general results in such a form that they can be readily grasped, and, if necessary, discussed. No person in the habit of attending scientific meetings like the Conference can have failed to observe the weariness that becomes evident in the audience during the reading of even valuable papers, the drift of which is obscured by the multitude of details.

Next Mr. Parker read a meritorious paper upon "Terpin Hydrate: its Preparation and Crystallography," which had been suggested by the occurrence of some crystals in a jar of furniture oil, supposed to have been compounded chiefly of linseed oil, turpentine, butter of antimony and methylated spirit. The author does not seem to be aware that the formation of such crystals in furniture polish is by no means a new experience; but it may be mentioned that in the early days of the School of Pharmacy, Bloomsbury Square, the conditions under which the formation of such crystals took place was the subject of many experiments in the laboratory, though without any satisfactory result being arrived at. Besides an elaborate description of the crystallography of terpin hydrate, the paper contained details as to its preparation and physical properties, and it mentioned the interesting fact that it is probable that terpin hydrate may be made to yield several aromatic oils by the action upon it of dehydrating substances under suitable conditions.

The next paper was on "A New Method of Making the Volumetric Solution for Estimating Hardness of Water," by Professor Tichborne. The novelty consists in the use of an oleate of soda, the preparation of which he describes, in the making of the soap solution. Dr. Symes then read "Some Notes on Brazilian Drugs," in which he described a gum derived from the *Acacia Angico*, known in Brazil under the name of "resin de angico," and said to be useful for chest complaints. Another drug referred to was a species of elemi, named "almesca," differing in some respects from the elemi of commerce. The last drug described was a bark named "casca de guassatunga," from which in Brazil an alcoholic tincture is prepared said to be useful in the treatment of snake-bites.

The chair was now taken by Mr. Groves, whilst a paper was read by the President, entitled "Half-an-hour with a Few Sheets of the New Pharmacopœia of the United States." The sheets upon which the remarks were based had been placed at the disposal of Professor Attfield by the courtesy of Professor P. W. Bedford, President of the American Pharmaceutical Association, who is also a member of the United States Pharmacopœia Committee. The work is printed in large octavo, and the divisions into the two classes of "Materia Medica" and "Preparations," which obtains in the last edition, is abandoned in favor of one simple alphabetical arrangement like that of the British Pharmacopœia. The system of chemical nomenclature advocated by Professor Attfield is again followed, and the author of the paper justly claimed that this proved that it was practicable and serviceable in the medicine and pharmacy of an English-speaking people. The old system of weights and measures is abandoned and the formulæ are, as a rule, expressed in parts by weight, but in cases where particulars of volume as well as of weight are required the metric decimal system

is employed. The Pharmacopœia opens with a new class of preparations termed "Abstracts," which are alcoholic extracts mixed with sufficient sugar of milk to make one part of the preparation represent two parts of the original drugs. The class includes abstracts of aconite, belladonna, conium, digitalis, hyoscyamus, ignatia, jalap, nux vomica, podophyllum, senega and valerian. A list of the additions and omissions was given, which cannot be referred to here further than to notice that "aconitia" is omitted, notwithstanding the assistance afforded to the Pharmacopœia Committee by Dr. Wright in respect to a definition of that substance. Further, the doses of drugs are not given, temperatures are stated in Centigrade degrees with Fahrenheit equivalents in brackets, chemical formulæ are inserted as in the British Pharmacopœia, and the molecular weight is appended to each formula. The interest excited by this paper was increased by the fact that Professor Redwood took the opportunity of stating that the preparation of a new edition of the British Pharmacopœia is now in contemplation. He said that he had little doubt that in it the same system of nomenclature would be adopted as in that of the United States, but he spoke with less certainty as to the adoption of the plan of indicating quantities in parts by weight, although he approved of the system and had himself worked it out years ago. He remarked that with respect to the Pharmacopœia of Great Britain a greater conservatism was exercised by the Medical Council than by the body that controlled the United States Pharmacopœia, since it did not introduce any unproved remedies. The reading of this paper brought the first day's business to a close.

In the evening a visit was made to the picturesque ruins of Netley Abbey by upwards of sixty members and visitors, carriages having been provided by the Local Committee. The pleasure of the excursion was slightly marred by atmospheric influences, the splendid view of Southampton Water and the opposite coast being nearly destroyed by the driving rain and mist; but notwithstanding this untoward circumstance the trip proved a very enjoyable one, and much interest was excited by the ruins.

On Wednesday morning the proceedings were resumed by the reading of a paper on "Some Reactions of Arsenic," by Messrs. Naylor and Braithwaite. The first portion of the paper was devoted to the results of some experiments made to test a statement of M. Patrouillard, and introduced into some text-books, to the effect that arsenic acid is easily reduced to arsenious acid by the action of oxalic acid. The authors failed to obtain any confirmation of this statement and expressed an opinion that oxalic acid exerts no reducing action under the conditions described by M. Patrouillard. The remainder of the paper was devoted to an account of the method followed in employing the copper-test, which is based upon the fact of the solubility of cupric arsenate in the double tartrate of potassium and sodium, and to a description of the decomposition which takes place between arsenious acid and mercuric salts.

The next paper read was entitled "Some Results of the Action of the Digestive Ferments on Drugs," and was by Mr. G. Brownen. It described the effect produced by solutions of the gastric ferment and pancreatic solutions upon a number of drugs and their preparations. The results obtained

suggest that this field of investigation will prove not only interesting but important to the physiologist, though evidently the value of such experiments will be increased in proportion as the conditions under which they are performed resemble those which occur in the human economy. It was pointed out in the discussion which followed that those conditions are very difficult to imitate, especially such of them as obtain in cases of disease, and it was objected by Mr. Plowman that the temperature at which the experiments were conducted (50°C.) exceeded that of the human body. Some little amusement was caused by the prohibition by the President of any reference to such a subject as "vital force" and by the difficulty some of the speakers experienced in their attempts to avoid the veto.

Mr. E. M. Holmes commenced his "Remarks on the Root of *Aconitum Napellus* and Allied Species" by pointing out that although aconite has long been in use in medicine, and is recognized as one of the most powerful of medicinal agents, its internal administration in this country is not so great as might have been expected. This he considers to be possibly due to variation in the strength of official preparations, and without attributing this variability altogether to the non-recognition in the Pharmacopœia of well-known facts he says that it appears certain that the requirements of the Pharmacopœia might be complied with and yet preparations of very variable strength be the result. He points out that the figure of the root referred to in the Pharmacopœia is totally inadequate to distinguish the root of *Aconitum Napellus* from that of other less poisonous species, and that the roots imported from Germany are collected by peasants not possessed of any botanical knowledge and sold without any guarantee as to the time of their collection. The difficulty is increased by the fact that the numerous aconites are closely allied, the varieties running one into another, whilst a complete series of the members of the genus is hardly to be found for reference in any botanical garden or museum. He, therefore, considered it worthy of inquiry whether the aconites available for pharmaceutical preparations might not be characterized for practical purposes by the effects produced by them when chewed. He found that the roots of several species did not cause a tingling sensation upon the tongue, including some plants which presented the specific characters of *Aconitum Napellus*, though easily distinguishable from it by habit. But all the aconites in which this variation occurred were observed to flower later than the typical *Aconitum Napellus*. He expresses the opinion, therefore, that the only way to secure aconite of good and uniform quality is to limit the official drug to home-grown aconite, flowering in May and June and gathered while the plant is in flower. He remarks, in conclusion, that aconite is very easy to cultivate and that, considering the small quantity used, there is no reason why any chemist who has a small piece of garden should not grow his own aconite root. Contrary to what might have been expected after the reading of so practical a paper, no discussion followed, and it may be remarked that the comments made upon the papers read at this meeting, as a whole, were far fewer than in previous years.

"Ammoniated Extract of Ergot and a Process for its Preparation" was the title of the next paper read, which was contributed by Mr. A. W. Ger-

rard. The process consists in macerating 10 parts of crushed ergot for 8 or 10 hours, with frequent stirring, in 50 parts of cold water containing ½ per cent. of strong solution of ammonia, straining through flannel, washing the ergot from time to time with more ammoniacal water till exhausted, evaporating the strained liquor to five parts (any scum or fat arising to the surface being removed), treating the cooled extract with an equal volume of aromatic spirit of ammonia, decanting the clear portion after subsidence, filtering the remainder through felt or flannel and washing the residue with sufficient spirit to bring the volume of the extract to 10 parts. One part of the extract, which thus prepared is darker in color than the ordinary form, contains the soluble matter of one part of solid ergot; the average specific gravity is 1,000, and the dose is the same as that of the ordinary liquid extract. The advantages claimed for the preparation are that the ammonia not only by its solvent power insures a complete exhaustion of the active principles of the drug, but by its presence in the medicine induces a rapid action by acting as a nervous stimulant. In the discussion which followed it was suggested that the ammonia by forming a soap took up a portion of the oil present in ergot, and thus facilitated the permeation and consequent exhaustion of the drug. The official formula found several defenders, Mr. Greenish being of opinion that water extracts all the active principle from ergot if the oil be previously removed. On the other hand, Dr. Quinlan said that in practice he had found ammonia in a preparation of ergot to be useful as a corrective.

Mr. Symons then read a paper on "Tumefaction as an Aid to the Identification of the Varieties of Maranta Starch." It contained the results of experiments made by treating different starches with solutions varying from 0·5 to 1·5 per cent. of caustic soda and also by submitting them to various degrees of heat until tumefaction took place. He found that when potato, oat, Natal, tous-les-mois, wheat, Bermuda, sago, maize, cassava, St. Vincent and rice starches were treated with caustic soda for ten minutes, they required for their complele tumefaction solutions increasing in strength in the order mentioned, from potato with a 0·8 solution to rice which required a 1·3 solution. When tumefied by heat and arranged according to the degree of temperature required, the order of the starches was nearly the same, with the exception of oat and cassava. It is worthy of remark that when using the alkaline method of tumefaction the order of the starches bears out a conjecture recently put forward by the author, that the higher the temperature at which a starch grows the higher is its point of tumefaction.

The next paper read was on "The Purity of Commercial Salts of Gold," by Mr. F. W. Branson. It gave the result of the examination of some fifteen-grain tubes of commercial salt of gold, eight of which were found to be correct within reasonable limits, whilst four showed a deficiency of 8 per cent. in weight or 5 per cent. in metal. The latter, although obtained from a reputable house, bore neither trade mark, seller's name nor guarantee label.

In the paper next read, on "The Iodides of Bismuth," by Messrs. F. W. Fletcher and H. P. Cooper, the authors described a new compound of bis-

muth, a very basic yellow iodide, represented by the formula $BiI_3.5Bi_2O_3$ or $3BiOI.4Bi_2O_3$, met with whilst testing metallic bismuth for lead.

The last paper read before the adjournment for luncheon was a note on "Microscopic Organisms in certain Inorganic Solutions," and contained the details of some experiments made as to the formation of a green vegetable growth in bottles containing solutions of sodium phosphate, magnesium phosphate and calcium sulphate, kept in the laboratory of the Yorkshire College of Science.

The Conference reassembled at 2·30 P.M., when a paper by Mr. D. B. Dott on "The Solubility of Morphia Salts" was read. It consisted principally of an adverse criticism of two papers on a similar subject by Prof. Power and Mr. J. U. Lloyd, and incidentally the author mentioned that he is engaged upon the compilation of a table of the solubility of morphia salts, the determinations being made at 60°F. In discussing this paper Mr. R. H. Parker suggested that it would be advantageous to establish standard conditions under which solubilities should be taken, since the solubility of many substances is much affected by varying circumstances. Mr. J. Williams said that he looked upon solubility as being closely associated with the power of crystallization, illustrating his remark by a reference to the compounds of caffeine recently described by M. Tanret, which he does not consider to be definite chemical compounds, but mixtures. Mr. P. W. Squire also pointed to the necessity of distinguishing between the point of solubility and the crystallizing point.

In some "Notes on the Pharmacy of Cinchona" Mr. R. W. Giles called attention to the unsatisfactory results that have followed the "fearful deterioration of Calisaya bark," both pharmacy and medical practice having been prejudiced through the consequent substitution of quinine for pharmaceutical preparations of the bark. He recommends that all pharmacists should keep in stock Indian or other non-official bark of sufficient alkaloidal value and that when opportunity offers they should educate the medical profession to the use of it. He considers that the standard adopted for the cinchona of pharmacy should be an alkaloidal and not a quinine standard, that it should be a mean and not an extreme one, and that it should admit barks from all sources. Further, he described a process for the determination of the alkaloidal value of cinchona bark which, he said, though simple and easy of manipulation, gives results near enough for pharmaceutical purposes. He expressed a preference for a fluid extract as a pharmaceutical preparation, but said that a fluid extract of cinchona worthy of its name was still a desideratum. In the discussion of this paper, Mr. Welcome recommended that the standard of a pharmaceutical bark should be fixed at 2 per cent. of quinine with a proper proportion of the other cinchona alkaloids. Mr. Southall spoke favorably of the decoction, which he said was largely used in the Birmingham district, and Dr. Symes said it was also a favorite preparation in Liverpool. On the other hand, Mr. Ekin reminded the Conference that he had found the decoction to be the preparation weakest in alkaloid. The discussion afforded Mr. Hampson the opportunity of saying that changes in the Pharmacopœia would be best effected, when necessary, under the advice of practical pharmacists, and

that the Pharmaceutical Society of Great Britain or the British Pharmaceutical Conference ought to be represented in the Pharmacopœia Committee in virtue of legal enactment.

"A note on the action of Glycerin upon some Salts of Iron," by Mr. G. F. Schacht, described the results of some experiments arising out of an alteration observed in a mixture made from the following prescription: "Tinct. ferri perchloridi, ʒiss; glycerini, ʒvi; aquæ, ad ℥vi." The mixture, when first prepared, was of a pale sherry color and possessed an astringent metallic taste; but the color afterwards nearly disappeared and the taste became sweet and metallic, but not astringent. The change was due to the reduction of the iron from the ferric to the ferrous condition, and experiments showed that this reduction takes place in the presence of ethyl alcohol, glycerin, and probably some other alcohols. Conversely, glycerin appears to retard though not absolutely to prevent the oxidation of the proto-salts. The President said that this action of alcohol upon a per-salt of iron had been long known, an ethereal spirit of chloride of iron prepared in this way having been formerly official in a continental Pharmacopœia.

In a "Note on a Reaction of Glycerin and Polyhydric Alcohols" Mr. W. R. Dunstan recorded the observation that the acid solution obtained by the addition of glycerin to an aqueous solution of sodium biborate becomes alkaline when heated. The reaction is also given by many other polyhydric alcohols and by certain sugars.

The interest excited by the introduction of Professor Barff's "Boro-glyceride" has induced Mr. D. Hooper to make some experiments upon the "Solubility of Boric Acid in Glycerin." He finds that at zero 100 parts of glycerin dissolve 20 parts of boric acid, that at 100°C. the quantity dissolved is increased to 72 parts, and that between these two temperatures the solubility is represented by an almost straight line.

Mr. B. S. Proctor having been somewhat skeptical as to the cause of the non-appearance of the results of oxidation in a commercial sample of liquor of iodide of iron, was induced to examine it, and the results furnished the subject of the next paper read. He proved the presence of phosphoric acid by its separation as ferric phosphate and that of oxalic acid by its separation as ferrous oxalate. The liquor also did not contain the quantity of iodide of iron required to make a syrup of full strength, when used according to the directions accompanying it. At the conclusion of his paper Mr. Proctor somewhat cynically suggested that if any pharmacist feels impelled to any other expedient than that of keeping his solution in contact with an iron wire he had better at least know what he is doing, and add the adulterations himself rather than buy the liquor ready adulterated, not knowing what it contains. Mr. Fletcher expressed a doubt whether any manufacturer who had a reputation to lose would add such a substance as oxalic acid, and, referring to the acidity of the liquor which had been mentioned by Mr. Proctor, said that it might be due to free hydriodic acid which is always formed. The usual *pro* and *con.* statements with respect to the permanence of syrup of iodide of iron and the effect produced by iron wire or light were made by different speakers, and Professor Tichborne expressed an opinion that a frequent cause of failure was that the heat was

not continued long enough in making the solution of iodide of iron to sufficiently remove the hydriodic acid formed.

A "Report on the Strength of Commercial Samples of Tincture and Liquid Extract of Opium," by Mr. J. Woodland, was then read. Fourteen samples of tincture had been examined, and taking the percentage of morphia present as a criterion, eight of them appeared to have been prepared from opium exceeding in morphia strength the Pharmacopœia standard; the other six were more or less deficient. Of ten samples of liquid extract of opium none reached the standard, and in one or two cases the percentage of morphia was very low.

The last paper read was a "Report on the Purity of Commercial Samples of Silver Salts," also by Mr. Woodland. It stated that caustic points had been found to contain from 25 to 36 per cent. of potassium or sodium nitrate, crystals of silver nitrate from none to 19 per cent. of the same diluents, and oxide of silver from 13 to 26 per cent. of impurities. It was remarked by the President that potassium nitrate is avowedly added in the preparation of caustic points in order to give them greater toughness, and Mr. J. Williams said that nitrate of lead is used for the same purpose. Both Mr. Williams and Mr. Naylor expressed surprise at the statements with respect to silver oxide, and said that it did not usually contain more than 1 or 1½ per cent.

The next business of the Conference would have been to decide as to the place of meeting in 1883; but the President having stated that it was not yet settled what town should be visited by the British Association, the arrangement with respect to Oxford having fallen through, it was agreed to leave the decision in the hands of the Executive Committee.

The election by ballot of officers for 1882–83 then took place with the following result:

President, Prof. Attfield, Ph.D., F.R.S., F.I.C., F.C.S.

Vice-Presidents,—M. Carteighe, F.I.C., F.C.S., London; J. R. Young, Edinburgh; C. Umney, F.I.C., F.C.S.

Treasurer—C. Ekin, F.C.S., Hounslow.

General Secretaries—F. Baden Benger, F.C.S., Manchester; S. Plowman, F.I.C., London.

Other Members of Executive Committee—Alexander Kinninmont, F.C.S., Glasgow; J. C. C. Payne, Belfast; W. A. H. Naylor, F.C.S., London; R. Chipperfield, Southampton; P. W. Squire, F.L.S., F.C.S., London; G. S. Taylor, F.C.S., London; J. C. Thresh, D.Sc., F.C.S., Buxton; F. W. Fletcher, F.C.S., London.

Auditor—James Spearing, Southampton.

Nothing now remained for the Conference to do but to record its sense of indebtedness to those friends who had contributed in various ways to make the meeting a success. First, the cordial and well-deserved thanks of the non-resident members were accorded to the Local Committee, and especially to Messrs. Randall, Chipperfield and Dawson, for the successful way in which they had carried out the arrangements. Then a vote of thanks was passed to General Cooke, Director-General of the Ordinance Survey Department, for his kindness in affording facilities to the members to visit

the Ordinance Survey Offices and inspect the operations going on there. Last of all came an enthusiastic vote of thanks to the President, for his conduct in the chair, and the members of the Conference then separated, not without some misgivings as to the weather for the evening excursion.

Any fears, however, which might have been entertained during the storm which raged on Wednesday night, as to the condition of the weather on the following day, were fortunately dispelled. The morning was faultless; the sun brilliant and the air delightful. Before half-past eight, the hour fixed for starting, members of the Conference were making a forced march to the pier-head, many, judging from an indescribable expression of "goneness" in their features, having evidently sacrificed breakfast to a heroic determination to be punctual. The steamer engaged for the trip was one of the finest boats in the Isle of Wight Company's service, and about one hundred and twenty excursionists, including a fair proportion of ladies, were on board, when a little before nine o'clock the signal for departure was given. The run to Ryde was most enjoyable, affording as it did, glimpses of many objects of interest; Netley Hospital, with its magnificent façade, and the ruins of the fine old Abbey close by, well contrasted the spirit of the Past and the Present, and Osborne, so delightfully situated amidst the peaceful beauty of its surrounding, evidenced the gentle spirit of its royal occupant.

Ryde was reached at 10.30, where a train was waiting to convey the party to Brading. Alighting here, a pleasant stroll through lanes and fields, rich in spoils for the botanist, brought the visitors to the remains of the Roman Villa. An inspection of the mosaic floors, some of which are in very perfect condition, and the many archæological treasures which have been turned up during the excavations, detained the company here until 12.30, when train was taken to Ventnor.

A short distance from the town, on the Bonchurch road, a substantial luncheon was served on the lawn in front of the residence of Captain Roache, who had kindly thrown open his grounds for the reception of the members of the Conference. The majority of the party then made their way through Bonchurch to the Landslip. The magnificent scenery of this spot is too well known to need description; suffice it to say that the expanse of sun-illumined sea on the right hand and the solemn grandeur of the gray crags to the left, intermingled with the varied tints of the luxurious foliage, made up a scene which by those who witnessed it for the first time will never be forgotten, and which by those who had already seen it many times before will ever be remembered with increased delight.

On the road along the cliffs to Shanklin stands the private residence of Mr. Gibbs, of Ryde, and at this point a pleasant surprise awaited the excursionists. Mr. Gibbs, gracefully assisted by his wife, welcomed into his house successive detachments of the party as they arrived; and beneath his hospitable roof every kind of comfort and refreshment was set before them. In the dining room were choice wines and fruits, and in the drawing room tea, coffee, and other light refreshments. Coming as it did so unexpectedly, and dispensed so courteously and generously, Mr. Gibbs' hospitality constituted one of the most delightful incidents of the trip.

After passing through the village of Shanklin and visiting its celebrated Chine, the party returned by rail to Ryde, and thence by steamer to Southampton, where at 7.30 high tea was served at the Royal George Hotel. Numerous speeches followed, and at a late hour the company dispersed, unanimous in the opinion that a pleasanter excursion had never been spent by the Conference.

Amongst the members of the Local Committee singled out for special thanks were Mr. Randall, the courteous Chairman, Mr. Dawson, the assiduous Honorary Secretary, and last, but not least, Mr. Chipperfield, the energetic "Acting Manager."—*Phar. Jour. and Trans.*, Aug., 26, 1882.

MINUTES OF THE COLLEGE.

The semi-annual meeting of the Philadelphia College of Pharmacy was held September 25, 1882, in the hall of the College, No. 145 North Tenth street.

The President, Dillwyn Parrish, presided, and the register showed an attendance of 24 members.

The minutes of the last stated meeting, in June, were read and approved.

The minutes of the Board of Trustees since the June meeting of the College were read by the Secretary of the Board, Wm. C. Bakes, and, on motion, adopted.

Alonzo Robbins, chairman of the delegation appointed to represent this College at the annual meeting of the American Pharmaceutical Association, reported as follows:

To the Philadelphia College of Pharmacy:

The delegates to the meeting of the American Pharmaceutical Association at Niagara Falls respectfully report that three of the original delegates attended the meeting, and that William B. Thompson was added to the number in place of Edward C. Jones, who was unable to attend.

The meeting was unusually large, and about 130 new members were obtained.

Our fellow-member, Charles A. Heinitsh, of Lancaster, Pa., was elected President of the Association for the ensuing year.

The Committee on Entertainment had prepared quite an extensive programme, but unfortunately they were unable to compel compliance with its terms by the proprietors of the hotel, thereby causing general dissatisfaction among the members of the Association.

It is to be hoped that at future meetings no reduction in hotel rates will be asked for, and no impositions submitted to.

The Association finally adjourned to meet at Washington, D. C., on the second Tuesday of September, 1883.

Respectfully submitted, ALONZO ROBBINS, *Chairman.*

Professor Maisch, on behalf of the delegates appointed to attend the Conference of Pharmaceutical Schools, held at the same time and place, made the following report:

To the Philadelphia College of Pharmacy:

The undersigned respectfully report that they have attended the Thirteenth Conference of Schools of Pharmacy, held at Niagara Falls, Sept. 13th. The Albany, Chicago, Cincinnati, Louisville, Massachusetts, Philadelphia, Pittsburgh and St. Louis Colleges were represented by delegates.

According to a resolution passed in 1881 the subject for discussion was the organization of an obligatory course in analytical chemistry, and the examination in this branch previous to graduation. The desirability of laboratory instruction in chemistry was generally conceded. But little concurrence of opinion was manifested as to the extent of such instruction; while several delegates urged the necessity of demanding attendance at a complete analytical course, including gravimetric and volumetric quantitative analysis, the large majority failed to see that the time for such a course could be obtained during the sessions of the Colleges, or that the end aimed at could really be attained. These views were expressed in the following resolution:

Resolved, That the importance of a knowledge of analytical chemistry is recognized by this Conference, and we believe that every effort should be made by the Colleges represented to encourage the study in the regular course of lectures; but it is the sense of this Conference that the course in analytical chemistry should not be made compulsory upon the student at the present time.

In nearly all the colleges a more limited analytical course, embracing mainly the requirements of the Pharmacopœia, in regard to the identity add purity of the medicinal chemicals, has been instituted, and has been made obligatory in several. The action of this College was explained, consisting in the elaboration of a practical scheme of analytical chemistry, limited in extent, which during the coming session is to be tried experimentally as an optional course for the senior students, with the view of making it hereafter obligatory, if necessary, with such modifications as may be ascertained by experience. The absence of all the professors placed in charge of the practical chemical instruction in the different colleges was a source of regret, since an interchange of their experience would have materially aided in furthering the objects of the Conference.

Three subjects have been selected for consideration at the next annual Conference, namely (1) the practicability of extending the course of instruction from five to six months, (2) the advantages of auxiliary instruction, and (3) preliminary examination.

Respectfully submitted, JOHN M. MAISCH,
JOSEPH P. REMINGTON.

Charles Bullock expressed his views relative to the advisability of increasing the list of honorary and corresponding members, stating that quite a number of those who had been with the College in that capacity had during the last few years been removed by death. Other members coinciding with him in this opinion, Mr. Bullock moved that a committee of three be appointed to revise the list, and report the result of their deliberations at the next meeting of the College. The motion being seconded, was adopted, and the committee was appointed in the usual manner, consisting of Messrs. Charles Bullock, Prof. J. M. Maisch and Prof. J. P. Remington.

Prof. Maisch again called the attention of the members to the importance of a better attendance of the monthly pharmaceutical meetings of the College, and expressed a desire that every member would exert himself to that end. All druggists, students and others interested in chemical and pharmaceutical science are hereby invited to attend these meetings, to read such original papers as they may prepare, and to participate in the discussions which take place.

An election for Trustees and a Committee on Deceased Members being in order, the President appointed Messrs. Thomas H. Potts and David W. Ross tellers, who upon taking the ballot reported the following gentlemen elected:

TRUSTEES FOR THREE YEARS.

William C. Bakes.....
Edward C. Jones..... } Term ending September, 1885.
William E. Krewson,.....

Trustee for the unexpired term of Andrew Blair, resigned.
Prof. Frederick B. Power.

COMMITTEE ON DECEASED MEMBERS.

Charles Bullock, Joseph P. Remington, Alfred B. Taylor.

Then adjourned. WILLIAM J. JENKS, *Secretary.*

EDITORIAL DEPARTMENT.

THE MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION at Niagara Falls was more largely attended than any previous meeting, with the sole exception of that held in 1876, when the Centennial Exposition at Philadelphia was the main cause for drawing over 350 members to this place. The time which can be spared for relaxation and for relief from his engrossing duties by a pharmacist actively engaged in business is at best limited, and when it is considered that many members in different parts of the country, for years past, have made their brief period of vacation to coincide with these annual meetings, it is not to be wondered at that a large number went in quest of that recreation, which heretofore was often scantily provided, and that the attendance at the sessions had been thereby considerably reduced. At the last meeting the plan of holding only one session on each day was, we think, very successfully inaugurated, and under the able management of the efficient Entertainment Committee and Local Secretary, gave substantial pleasure to all visitors. We refer more especially to the various concerts by Wahle's band, to the ladies' reunion in Prospect Park on Tuesday afternoon, to the vocal concert by the Buffalo Singing Society, the Niagara Falls Liedertafel, and several soloists on Tuesday evening, to the excursion to the Whirlpool Rapids on Wednesday afternoon, and to the ramble on Goat Island and other delightful spots on Thursday afternoon. In addition to these the grand ball on Wednesday evening and the banquet on Thursday evening furnished not less enjoyable attractions to the large majority, and the pleasure was but little marred by the refusal of the hackmen to abide by their contract, by the threat of the hosts of the Cataract House to turn off the gas long before midnight, while the banquet was still in progress, and by other unpleasantries at this house. This official providing for remission from labor had the effect of making nearly all the sessions better attended, only the last one, more particularly the latter part thereof, leaving room for improvement, and we have no doubt that those present are unanimously in favor of retaining the services of the members of the Entertainment Committee as long as they can be found willing to serve in that capacity. By thus continuing their work from year to year their experience would soon become of still greater value, both in the matter of traveling arrangements to and from the meetings and of providing for substantial recreation and enjoyment after the sessions.

The organization of the Council, two years ago, had much influence in rendering possible such arrangements, inasmuch as the sessions of the Association have thereby been relieved of a very large amount of routine work, and of discussions relating only to executive measures, and we believe that in this direction there is still room for curtailing, without in the least interfering with the right of every member to be heard on any subject that may come before the Associatian, if such deliberations were held outside of the meeting at sessions specially held for the purpose under the auspices of the Council, so that only the results thereof would be brought forward for final

action by the Association. Nearly its whole time could then be devoted to the discussion of papers and of subjects of general pharmaceutical interest. It is true that the labor of the Council would thereby be increased, but we apprehend not the slightest difficulty in finding tried and experienced men, willing to give their time for the benefit of the Association, and for the furtherance of its objects.

Seventeen papers were read at the meeting, a smaller number than might have been expected from such a large representation. It has been suggested by several members that a falling off in the number of these essays must be expected in consequence of the multiplication of State and County Pharmaceutical Societies, by which bodies a number of papers would be absorbed which would otherwise have been presented to the National Association. We believe that such is not the case, or only to a very insignificant degree; but we are convinced that the fault lies rather in the defective manner of securing the co-operation of members. During the 26 years since queries were presented for investigation it has rarely happened that more than one-third of them have been answered at the next meeting. This failure is not due to indifference on the part of the acceptors, but in nearly all cases to causes which could not be foreseen at the time of acceptance; and it has thus happened that members who by the force of events were compelled to disappoint the Association in the expectation of receiving the results of their investigations, as a rule, afterwards refused to accept other queries so as to be relieved from the unpleasantness of breaking an implied promise. On the other hand, members who could and would have answered some of the published queries refrained from doing so because other members had been announced as willing to furnish the reply. In our opinion there exists no good reason whatever for this practice; on the contrary, we can see good reasons why it should be discontinued, and why the names of those willing to work for the Association, while they should be known to the proper committee, should not be made public. It would frequently happen that two or more members would investigate the subject, thus extending the investigation in different directions, and if one should be prevented from carrying out his intention, he would not hesitate to privately accept a subject on another occasion, because he would feel that by so doing he would not deprive the Association of communications from others. It should be remembered that the volunteer papers have occasionally outnumbered those written in answer to queries, and that at the late meeting eight valuable papers, out of the seventeen, were voluntary communications, made without a promise given a year or two before.

We can merely briefly refer to the excursions an the homeward trip. Those laid out by the Entertainment Committee were not very numerously participated in, because many members had been over the same routes after the meetings held in Boston, Toronto and Saratoga; perhaps in no distant time a meeting in Maine or on the St. Lawrence River will again take the members to the same interesting country through which these excursionists traveled. A number of the members visited Watkins' Glen, Trenton Falls, Howe's Cave nd other places of interest, as far as we have learned, all highly pleased with their journeys.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

The Prescription of Proprietary Medicines for the Sick; Its Demoralizing Effects on the Medical Profession. By C. A. Lindsley, M.D., etc. New Haven. Pp. 16.

The essay was read before the Connecticut Medical Society in May last. We are pleased to notice that the medical profession seems to be waking up to the evil effects of proprietorship in medical preparations.

Ten Years' Experience in the Treatment of Stricture of the Urethra by Electrolysis. By Robert Newman, M.D., etc.

Reprint from the "Medical Record," August 12 and 19, 1882.

Life of John M. Briggs, of Bowling Green, Ky. By W. K. Bowling, M.D.

The Antiseptic Treatment of Wounds after Operations and Injuries. By W. T. Briggs, M.D.

Reprints from the "Nashville Journal of Medicine and Surgery," July and August, 1882.

Proceedings of the Ohio State Pharmaceutical Association at its Fourth Annual Meeting, held in Zanesville, May 17 and 18, 1882. Cleveland, O. 8vo, pp. 95.

Proceedings of the Fourth Annual Meeting of the New York State Pharmaceutical Association, held in Albany, Wednesday and Thursday, June 20 and 21, 1882. Elmira, N. Y. 8vo, pp. 160.

Reports of these meetings will be found on pages 331 and 380 of this volume.

Die Naturgeschichte des Cajus Plinius Secundus. Von Prof. Dr. G. C. Wittstein. Leipzig: Gressner & Schramm. 12, 13, 14 Lieferung. Plinius' Natural History. Parts 12, 13, 14.

This publication has proceeded to Book xxxvi, treating of rocks and stones.

The Relation of Pharmacy to the State. Introductory Address delivered to the Members of the Conference on August 22, 1882, by the President, Prof. John Attfield, Ph.D., etc. 8vo, pp. 22.

An excellent address, which we hope to find opportunity for referring to more in detail.

Diseases of the Rectum and Anus. By Charles B. Kelsey, M.D., Surgeon to St. Paul's Infirmary for Diseases of the Rectum, etc. New York: Wm. Wood & Co., 1882. 8vo, pp. 299.

It has been the author's endeavor to give, as far as possible, in a condensed manner, all that is positively known on the subject of this treatise, and to arrange the material in a form suitable for ready reference. The diseases and their treatment are considered in separate chapters, wherever it seemed of advantage illustrations have been resorted to, and in the more important cases references are given to the journals and works containing original essays referred to. A full table of contents and index render the work more useful for ready reference.